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ABSTRACT

The Proceedings Journal contains 13 articles presented at the American Educational Research Association annual meeting as part of the Arts and Learning Special Interest Group program. Individual articles and their authors are: "A Descriptive and Analytical Study of Art Criticism Formats with Implications for Curricular Implementation" by Karen Hamblen; "Teaching and Learning in Art: The Acquisition of Art Knowledge in an Eighth Grade Class" by Nancy R. Johnson; "Art and Science in Technical/Rational Society" by Philip Steedman; "Preschool and Third Grade Children's Development of Drawing Strategies to Represent the Perspective of a Three-Dimensional Model" by Cynthia B. Colbert; "Observation Drawing: Changes in Children's Intention and Translation Methods Grades K-6" by Nancy R. Smith; "What Children Draw or Do Not Draw from What They Can or Cannot See: Implications for Teaching Art" by Jean C. Rush; "An Argument for Social and Moral Arts Curricula" by Susan W. Stinson; "Relationships between Writing and Drawing in First Grade Children" by ViLora Lyn Zalusky; "Constructing Musical Knowledge" by Gary Greenberg; "The Effect of Sustained and Nonsustained Tones on Adults' Representations of Simple Rhythms" by Carolyn Hildebrandt; "Observing Children's Metacognitive Structures through Music-Rhythm Processing" by Linda L. Kelley; "Spatial Relations in Stereotypic Representations" by Stuart Reifel and Elizabeth Strand; and "The Effect of Verbalization in Understanding Visual Art" by Judith S. Koroscik. References and the conference program are included. (TRS)

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American Educational Research Association

Arts and Learning SIG

PROCEEDINGS

1985 Annual Meeting — Chicago

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American Educational Research Association

Arts and Learning SIG

PROCEEDINGS

1985 Annual Meeting — Chicago

Edited by
Judith Koroscik & Terry Barrett
The Ohio State University

Preface

The research reported in this volume was presented at the 1985 annual meeting of the American Educational Research Association as part of the Arts and Learning Special Interest Group program. Papers were selected for the program in a blind review process by ViLora Lyn Zalusky, Program Chair, and the Program Committee whose members included:

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Judith Koroscik and Terry Barrett, The Ohio State University
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A Descriptive and Analytical Study of Art Criticism Formats with Implications for Curricular Implementation

Karen A. Hamblen
California State University at Long Beach

Increasingly, art educators are proposing that art classes, in addition to studio experiences, provide instruction in art history and art criticism. The purpose of this paper is to provide a review and analysis of the literature on art criticism procedures. Art criticism formats are reported and supporting literature is assessed for theoretical and research rationales, anticipatory information, types of objects to be studied, and instructional cues. These five dimensions are referenced to educational and philosophical perspectives and to student readiness levels. This study attempts to answer the following question: If an art teacher were to read relevant art education literature on criticism, what information would be found helpful for implementing art criticism instruction?

Art Criticism Formats

Art criticism formats have in common a linear step-by-step approach in which steps build upon each other. Undoubtedly, Feldman's method consisting of (a) description, (b) formal analysis, (c) interpretation, and (d) judgment has been the most thoroughly examined art criticsim format in art education. Gaitskell and Hurwitz (1958), Hurwitz and Madeja (1977), Mittler (1980), and Smith (1967) use the four steps, with Smith differentiating between those aspects that are exploratory and those that are argumentative (see Figure 1). The traditional four steps are characteristic of critical thought in general and can be found as critical analysis procedures in any number of disciplines.

Briefly, the description category consists of making an inventory of what is perceptually present. Formal analysis involves an examination of the relationship among design elements. Interpretation involves a discussion of meanings, themes, and problems solved. Judgment consists of an assessment of value that is based on specified criteria.

On the basis of their formal characteristics, art criticism formats appear to fall generally into the following categories: the traditional steps of Feldman's method, the deletion of one or more steps of the traditional format, elaborations that include anticipatory or preparatory exercises, and adaptations to learning theory hierarchies. The formal characteristics of a format are its most obvious, public presentation. The formal

Correction

Transformational Cues	Aesthetic Object or Event	Aesthetic Theory Type	Research Base	Theoretical Rationale
	X	(X)	Exemplars	X
Smith (1967, 1973)	Exploratory Description Analysis Interpretation Argumentative Evaluation			
Johanson (1982)	Expression Expression Constituent	Beardsley, Ingarden	X	Exemplars (X)
Hamblen (1984)	Knowledge Comprehension Application Analysis Synthesis Evaluation	Bloom		(X) X
Clements (1979)	Analysis Hypothesize Confirm	(Inductive)		
Silverman (1983)	Historical Perspective Description Judgment			
Mittler (1967a, 1976b, 1980, 1982)	Description Analysis Interpretation Judgment	Bruner	X	(X) X
Madeja (1979)	Perception Description Analysis Judgment	Arnheim		
Hurwitz & Madeja (1977)	Description Analysis Interpretation Assessment	(X)		(X) (X)
Gaitskell & Hurwitz (1950)	Description Formal Analysis Interpretation Judgment			(X)

	Barban & Chapman (1967)	Description Interpretation Explanation Judgment (tentative)	X		(X)	all types	X
	Feldman (1970,1981)	Description Formal Analysis Interpretation Judgment	X		(X)	all types	(X)
	Armstrong & Armstrong (1977)	Informational Leading Synthesizing	Aschbel, Joyce, Stripps Lawler			student work	X
	Feinstein (1969,1984)	Description Analysis Metaphoric Interpretation Evaluation Preference		X	X	X	X
	Taunton (1981,1984)	Visual Qualities Choices Idea Sources Idea Elaboration Choice-Idea Relationship Intentions & Efforts Flexibility & Curiosity Evaluation	Gallagher & Aschner			student work & other	X
	Cloud (1982/1983)	Prenanalysis Introduction by Teacher Impression by Student Analysis Description Interpretation Evaluation	Piaget, Skinner, Thalen & Plato Feldman, Martin & Jacobus, Mayher Bolker, Rice	X	X		
	Lanford (1984)	Receptiveness Orienting Bracketing Interpretive Analysis Synthesis	Kant, Merleau-Ponty		X		X

CONTINUUM TENDENCIES
Academic Nationalism--Cognitive ProcessesSocial Adaptation--Personal Relevance
Realism--Idealism--Pragmatism--Existentialism
Subject-Socey-Student
Low-(Student Reiness)-High
Teacher Originated-udent Originated
Inductive--Deductive--Intective (Group)--Empathic

Figure 1. Art Criticism Formats Cross-Referenced with Art Critical, Educational, and Philosophical Continuum Tendencies.

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characteristics of art criticism formats, however, tell little of how they are to be implemented, only hint at how their authors intended them to be used, and reveal essentially nothing about the range of information presented with the format.

Dimensions of Analysis

The purpose of the chart in Figure 1 is to present a summary description and analysis of selected art criticsim formats that might aid curriculum decisions. Literature descriptions accompanying the presentation of an art criticism format were analyzed along five dimensions: theoretical foundations, research foundations, anticipatory set, object of study, and instructional cues.

If a dimension is clearly stated and stressed in the literature, it is checked X. When possible, descriptors, antecedents, or sources are specified. If a dimension's presence is implied, merely mentioned, or requires extensive interpretation, the dimension is indicated by a (X). For example, at one point, Feldman (1973) mentions the Socratic questioning method, yet whether a teacher could implement this methodology from his statements is highly doubtful. Some authors devote a phrase to a dimension; others, paragraphs.

Philosophical-Educational Continua

The formats and their accompanying tabulated characteristics in Figure 1 are cross-referenced with a continuum of philosophical and educational perspectives. To provide a cross-reference along major educational-philosophical orientations, a composite of perspectives was necessary. Eisner's (1979) educational perspectives, with the exception of technicism, were found to be comprehensive and applicable to a comparison with major philosophical perspectives and Tyler's (1949) tripartite paradigm of instructional focuses (see Figure 2). The work of Rice (1977/1978) and Rosen (1968) was helpful in placing educational perspectives in relationship to philosophical orientations. Chapman (1978) does not endorse any one art critical approach, but rather presents the steps and applications of four different methods: inductive, deductive, interactive, and empathic. These four categories generally subsume the possible pedagogical types of available art criticism formats.

In Figure 2, art critical, educational, and philosophical perspectives are listed on parallel continua that extend from an emphasis on external controls on the left to an increasing reliance on internal directives on the right. Hutchens' (1985) discussion of instructional styles, as related to Clark and

Chapman (1978)	ART CRITICAL Inductive Perceive/ Describe Interpret Judge	Deductive Hypothesize Interpret Judge	Interactive Perceive/ Describe Interpret Consensus		Empathic Perceive Form Analogies Use Associations Act Out Judge
Eisner (1979)	EDUCATIONAL Curriculum as Technology	Academic Rationalism	Cognitive Processes	Social Adaptation & Reconstruction	Personal Relevance
Rice (1977/1978)	ART CRITICAL Object		Millieu		Interconnections
	EDUCATIONAL Hierarchical, Discipline-Centered		Holistic, Process-Centered		Arbitration, Hueristic-Centered
Rosen (1968)	PHILOSOPHICAL Idealism	Realism	Perennialism	Pragmatism	Existentialism
Tyler (1949)	EDUCATIONAL Subject		Society		Student
	← (from external controls to internal directives) →				

Figure 2. Art Critical, Educational, and Philosophical Continuum Tendencies.

Hamblen 5

Zimmerman's (1978) levels of student competencies, suggests that a student's readiness level may be prescriptive of the degree of control and structure to be exercised by the teacher. For example, a low readiness level may require teacher-originated material and a focus on specific objects of study; a high readiness level may indicate that the student will be able to rely more on the internal directives acquired from past art critical experiences. Likewise, philosophically, there is an emphasis on the nature and character of the object, on rational constructs, and on learned traditions among those perspectives on the left. On the right, there is a tendency toward giving credence to variable interpretations resulting from a transaction between self and reality.

The philosophical-educational perspectives listed in Figure 1 and their parallels to student and teacher behaviors are approximate. Moreover, the art criticism formats are not given precise correlates with philosophical-educational perspectives. The latter are continuum tendencies. Those art criticism formats toward the top of the chart in Figure 1 tend toward more systematic organization, the teacher's shaping of appropriate responses, and an emphasis on traditional subject matter, such as the study of artistic exemplars. The object of art and its characteristics take precedence. The continuum extends from external directives on the top to internal controls predominating toward the bottom. Toward the lower part of the chart, formats tend toward an emphasis on the subjective responses of students and student selection of procedures and objects to be studied. The order in which the formats are listed is relative and approximate. The remainder of this paper is devoted to a discussion of aspects of the chart in Figure 1.

Theoretical and Empirical Bases

Lankford (1984) finds that much art criticism fails to be grounded in foundation areas of inquiry so that positions can be evaluated and defended. References to theoretical rationales are often vague and cursory, making it difficult to properly assess the merits and applicability of given art criticism formats. In the art criticism literature reviewed, with the question of dissertations, Lankford is unique in that he clearly cites his assumptions and labels them as such. Authors of dissertations seem to present a fairly comprehensive theoretical and research rationale for their art criticism formats. For example, Cloud (1982/1983) incorporates five aesthetic theories, three learning theories, and eight critical approaches. (Also see Johnson, 1971/1972; Kordich, 1982.) Philosophical aesthetics, perceptual theory, and learning theory constitute the major foundational areas referred to in the literature. Anthropological and sociological foundations appear to have had minimal impact.

Philosophical Aesthetic Foundations

Theories of art have been used to form the criteria on which to base judgments (Chapman, 1978; Feldman, 1981) or have served as organizers that provide a focus for the art criticism process itself (Mittler, 1982). Aesthetic theoretical positions have generally encompassed imitationalism, formalism, expressionism, and instrumentalism. It has been recognized that no one theory will adequately serve as an all-time foundation for art criticism but rather that the character of an art object and the circumstances and purposes of art criticism instruction will dictate which theory or theories will be selected to serve as guidelines. Feldman and Mittler appear to believe that such selections are made relatively objectively and foster the development of art critical skills. Geahigan (1975) argues that these selections and their application are subjective, indicate taste preferences, and are part of a method, rather than skill-producing.

A more pervasive reliance on philosophical aesthetics is evident in discussions on the nature of aesthetic responses, what types of comments are admissible and appropriate in art critical analysis, the criteria that are to be used for judgments, how engaging in art criticism relates to the aesthetic experience, and the actual benefits to be gleaned from engaging in art criticism. In ongoing, often wide-ranging discussions of such issues, it is difficult, if not impossible, to ascertain the foundations of specific philosophical-aesthetic theories.

Perceptual Theory Foundation

In contrast to aesthetic foundations, perceptual theory has found much more clear application in art criticism literature. The growing understanding of an art object that occurs as one proceeds through an art criticism format has been paralleled to stages of perceptual development as well as perceptual experiences in general (Madeja, 1979; Mittler, 1976b). For example, Bruner's four stages of discriminate perceptual decision-making are initiated by a cursory primitive scanning, proceeds to a seeking of relevant cues and a tentative categorization, and is confirmed by a final categorization. As a hypothesis-testing, transactional explanation of perception, Bruner's model provides compatible correlates to art criticism formats as well as a theoretical foundation for aesthetic perception itself.

Ecker (1967) differentiates between psychological judgments that are subjective and indicative of unsophisticated responses to art and value judgments that are based on the logical processes and outcomes of art criticism, specified criteria, and referential evidence. The often-stated purpose of art criticism is to develop

a perceptual thoroughness with ever greater discriminatory power being called into play so that aesthetic judgments are informed and can be shared with others.

Learning Theory Foundations

Similarities between the traditional art criticism four-step format and hierarchies of learning and instructional taxonomies have been discussed by a number of authors. Hamblen (1984) has developed an art criticism questioning methodology within the framework of Bloom's taxonomy, with further similarities noted to the hierarchies and developmental models of Gagne, Guilford, Harrow, Krathwohl, and Piaget. Armstrong and Armstrong (1977) refer to Gagne's hierarchy of learning, Parsons' analysis of teachers' questions, and Ausubel's use of advanced organizers; Taunton (1984) finds Gallagher and Aschner helpful for shaping questions to be used in art criticism dialogues.

Learning hierarchies not only provide an instructional format but also indicate the patterned progression through which, it is often believed, learners progress over a period of time. As a function of experience, and to some degree maturation, students move from the simple to the complex, from a level of idiosyncratic and literal responses to art to a sensitivity to art's objecthood and the development of multiple perceptual discriminations. Hamblen (1984), however, cautions that similarities between an art criticism format and a learning hierarchy may merely indicate a pedagogical compatibility that can be profitably combined in an educational system in which there is a familiarity with and receptivity to the use of hierarchical constructs.

Research Bases

Although art education literature contains numerous studies on artistic responses and preferences, few of these have been done specifically for application to art criticism instruction. In the literature reviewed, art criticism formats are most often accompanied by descriptions and discussions of their benefits and purposes. A few, such as Smith (1967), describe the actual implementation of a program, and Mittler (1976a) and Feinstein (1984) have conducted research that has had an impact on the formats and methodologies they propose.

Hollingsworth's (1983) study comparing habituation, counter-attitudinal, and art criticism applications and Wilson's (1966/1967) research on aspective responses have important implications for art criticism instruction. A strong empirical base for art criticism, however, has yet to be established. Primarily a conceptual case has been made for the justification of art criticism instruction.

Preliminary Information

Imparting preliminary information or providing psychological exercises to place the student in a right relationship with the art object is an integral part of some formats (Cloud, 1982/1983; Lankford, 1984). In discussing the development of cue search skills by using major theories of art, Mittler (1976b) proposes that students be given information on what to look for in the art object. For Feldman (1973) and Johansen (1979), the art critic needs to possess some technical knowledge; for Johansen, bracketing techniques should also be taught to eliminate "fugitive thoughts, anticipations, and presuppositions about meaning" (p. 10). In contrast, Ecker (1972) prescribes an inductive approach wherein the work of art is the starting point, and the student is not to enter the art criticism experience with a theory in hand.

Throughout Johansen's (1982) art critical process, the teacher is to engage in a dialogue with the student, shaping and correcting responses so that the student attends to primarily aesthetic qualities. Although this is a fairly common goal in art criticism, the prescribed amount of control to be exercised by the teacher is variable. Preliminary information, psychological exercises, dialogue methodologies, etc., may be used to elicit open-ended, student-originated ideas, or they may be used to sensitively guide the student to predetermined conclusions and outcomes. Those formats tending toward the former approach are located toward the bottom of Figure 1.

Object of Study

The type of art objects suggested for study, who should select objects for study, and who should be relied upon for judgment are some of the strongest indicators of where a format lies on the philosophical-educational continuum. Armstrong and Armstrong (1977) and Taunton (1984) apply art questions to the student's own work, which has been the traditional focus for most types of art discussions. Feldman (1970, 1973) considers art criticism to be a means for students to understand the role art plays throughout their lives, "the meaning of clothing, furniture, domestic architecture, and product design" (1973, p. 55) and to provide the critical skills necessary to combat the invidious effects of the mass media. The assumptive world of the student is also given credence by Lankford (1984) and Mittler (1976a) who stress that background, biases, and abilities must be taken into consideration. Hurwitz and Madeja (1977) believe a phenomenological "insistence upon the total elimination of the extraneous is understandable for a teacher in the university. Children, on the other hand, are interested in many contexts of art, and to deny this interest may be to withhold information that may be crucial

in building and maintaining interest" (p. 14). In contrast, Smith (1967) and Johansen (1982) prescribe that art criticism be applied to exemplars of art in order to develop a cultivated sensibility. Hence, these two formats are located toward the top of the chart; the teacher originates curriculum content and maintains strong guidance.

Instructional Cues

Although an art criticism format itself may be considered a methodology, more specificity than a mere iteration of procedural steps is necessary for implementation. Smith (1967) describes the implementation of a program, and Gaitskell and Hurwitz (1958), Johansen (1982), and Taunton (1983) give examples of student-teacher dialogue. Hamblen (1984) proposes an art criticism format based on Bloom's taxonomy that a teacher can use to generate questions in each of the steps. In proposing a questioning strategy, Armstrong and Armstrong (1977) point out the need for teacher training and practice which goes beyond a mere familiarity with the benefits of asking well-constructed questions that tap higher cognitive levels of thinking. To this extent, adequate literature on art criticism is an essential, but only first, step toward implementation.

Summary

In response to the original question of what an art teacher would find in the art criticsim literature reviewed, one can answer as follows. There is much discussion of aesthetic concerns, but few specific relationships made to foundational origins, let alone appropriate educational applications. Art criticism formats are presented with little specific information on their intended audiences or specific methodologies for implementation.

Art criticism has the potential for being the most clear-cut instructional area of the aesthetic education model. No other area has an instructional format integral to its being. This potential for clarity, however, needs to be capitalized upon in the literature. In adjunct to the types of discussions that now exist, it is herein proposed that authors also need to mention their theoretical bases, relevant empirical studies, teaching methodologies, and how their methodologies relate to their goals. The delineation and analysis of art criticism formats along educational-philosophical continua in Figure 1 indicate some very preliminary and generalized criteria that can be used in making curriculum decisions.

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Teaching and Learning in Art: The Acquisition of Art Knowledge in an Eighth Grade Class[1]

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Studies of children's knowledge about art have been approached almost exclusively from a psychological orientation rooted in human physiology (e.g., Golumb & Farmer, 1983; D'Onofrio & Nodine, 1981; Parsons, Johnston, & Durham, 1979; Gardner, Winner, & Kircher, 1975; Gardner & Gardner, 1970; and Janes, 1970). Such an approach overlooks the importance of social interaction, culture, and history in the formation of children's art knowledge. To fully understand the human condition, we must examine the webs of meaning by which human beings give significance to their lives, especially when studying visual art, a sociocultural phenomenon that is replete with meaning and interpretation.

Objectives

The purpose of this study was to examine the teaching-learning process in an eighth grade art class from a sociology of knowledge perspective. Questions to be answered were: (a) What kind of knowledge is shared with students? (b) How and why did the teacher select this knowledge? (c) How is the knowledge communicated? (d) What knowledge do students have about art in general and the specific lessons that were taught? (e) What do students think about and how do they think while making or responding to art? (f) What do teachers think about as they teach?

Theoretical Framework

The theoretical orientation for this study in the sociology of knowledge is a composite one derived primarily from the Berger-Luckmann (1966) account of socialization, Spradley's (1980) approach to ethnoscience, and Blumer's (1969) symbolic interactionism. It also draws upon Brown's research (1977), and Lakoff and Johnson's (1980) work in metaphor and cognition, and current work in sociolinguistics and education described by Green and Smith (1983). Key ideas in this theoretical point of view are: (a) much of our knowledge is constituted through social interaction; (b) knowledge is perspectival and involves culturally appropriate meanings and interpretations; and (c) socially derived knowledge is internalized in human consciousness at a taken-for-granted level.

In sum, acquired knowledge or culture is an imperfectly charted, continually revised, cognitive map. It consists of conceptual metaphors that provide mental templates, frames of reference, perspectives, and sets of principles for guiding, but not compelling, human action and the interpretation of experience. This knowledge cannot be directly observed. It is reflected in the symbols, codes, and patterns of language created and used by human beings in historical continuity. As stated by Luckmann (1984):

> Language is the repository of past communicative acts in which people coped with problems of everyday life. Languages are the core of social stocks of knowledge. They are not only ways of looking at reality but also ways of dealing with reality and thus, even if indirectly, ways of making reality. (p. 14)

Luckmann maintains that society, and social communicative behavior, are not surface manifestations of hidden laws belonging to an underlying reality, but are face value phenomena resulting from social interaction. Bidney (1967) likewise noted the dependent and derivative existence of culture, which is man-made and to be differentiated from the giveness of nature and the physical world.

Methods and Techniques

Because this study deals with the symbolic aspects of human life and how social knowledge is built up or constructed through the actions of human beings, it is appropriate to draw upon phenomenological sociology as a ground for ways to study these phenomena. Phenomenological sociology is concerned with exploring social reality from the standpoint of the subject (Jehensen, 1973). This involves several steps. First, a description of the phenomena under consideration is obtained from the persons being studied and from observations made by the researcher. Second, the structure and configuration of the phenomena in question are documented from the description. This allows the symbolic and conceptual phenomena comprising culture and social reality to be made visible and clarified. The phenomena are reflected from the descriptive materials somewhat like a content analysis or taxonomy. Third, the phenomena are reflexively analyzed. A critique is made of observations derived from the description and the documentation of the structure and configuration. According to Husserl (1970/1954), phenomenology is a reflective and critical method that deals with phenomena appearing in human consciousness in a systematic way.

Information for this study was gathered through participant-observation, interviews, and a questionnaire. Field notes, handouts for lessons, audiotapes, and student responses to the questionnaire form the data base for the description and analysis.

Data Source

The study was conducted in the art room of a junior high school in a small city in an eastern state. This school was chosen because of the art supervisor's recommendation to work with the art teacher there. The school served mostly upper middle class students. A nine week art course was required in seventh and eighth grade while in ninth grade it was an elective.

The class studied was chosen by the teacher and consisted of 29 students of whom about 4 or 5 were special education students with learning disabilities involving speech or reading. The teacher and the students were observed for 28 daily class meetings lasting 45 minutes each. This art course began at the onset of my observations and ended approximately a week after the observations were concluded.

Results

This part of the paper will answer the six questions stated in the objectives and serves as the description for the study.

What Kind of Art Knowledge is Shared with Students?

At the beginning of the 9 week course, students were given a handout that listed the following assignments: two-point perspective (street); three-point perspective (books); lettering 3-D; shading (ribbon); pencil drawing #1: still life shaded; still-life close up #2; still life closer #3; mounting pencil drawing; watercolor #1; watercolor #2; copper relief; matting copper relief; clay; and pen and ink drawing. This list comprised the teacher's "official" curriculum from which she chose different assignments that would actually be taught. In 9 weeks it was not possible to teach them all, so each time she taught the course she would choose a different combination of assignments based on the kind of class she had, her interest at that time, and the amount of time left in the course as it progressed. In the course description, the teacher also said: "We will study famous artists and learn how they developed their work and why they became famous."

In the class that I observed, the following projects were assigned: one-point perspective - aerial bird's-eye view of a highway crossroads in a city; an exercise in two-point perspective at different eye levels; an exercise in shading; three exercises in pencil: a design with lines, a design with shading and shapes, and a design with a pattern; a combination drawing using the three types of design in the previous lesson; videotape lessons on basic forms and shapes that one can use to make

a picture (the Draw Man series from PBS): two-point perspective--exterior view of a corner with buildings, sidewalk, and a road; and a copper tooling design.

How and Why Did the Teacher Select This Knowledge?

The lessons and art knowledge comprising the curriculum were selected for a variety of reasons. Some curriculum work and lessons had been designed by the previous teacher who was known to be excellent. Many of her ideas were used as well as a textbook she had chosen: All About Art: An Introduction to the Basics of Art by Rachel Baker (1971). The text included these topics: the language of art, elements, principles, arts. A second influence on the curriculum was the teacher's experience in art when she was a child. She never learned the "basics" in art so she thought about her curriculum in terms of "what would have been good for me to have done." Another consideration was the preparation of a new state art guide which included the elements and principles of design. For the assignments in making designs using lines, shading, shapes, and patterns, the teacher referred to a "clip-card" lesson from School Arts magazine entitled, "Design: Geometric Lines." An additional source of curriculum ideas for the teacher were her trips to art in museums, university courses in drawing and design, and art books from the library. She took notes and made sketches of what she saw and experienced and found ways to adapt these ideas to her curriculum.

Underlying all of these considerations were the teacher's beliefs. A major one was that art is serious and one must work at it. In the course goals and objectives shared with the students, she stated that art increased their physical, perceptual, social, and aesthetic growth, they would be introduced to and experiment with a variety of art materials, and they would learn the basics of art. In a handout under, ART PRACTICES IN THE CLASSROOM, the teacher listed: ART is a way to enrich individual awareness and understanding of the world of nature and the world of man through an increased development of the sensory mechanisms.... ART is a way to enrich appreciation of artists, art works, and aesthetic forms. ART is a way of becoming a creative person. ART is a way of becoming a flexible, confident person.... ART is a way to clarify and fix ideas in the mind.... The handout stated at the beginning: "The purpose of this class is to learn to be more observant of the beauty of your surroundings while being more creative."

How is the Knowledge Communicated?

The art knowledge in the lessons was communicated in many ways. The teacher used lectures, demonstrations, one-to-one instruction, handouts, a textbook, videotapes, and at least one or two good examples of work from previous classes. In the copper tooling lesson, the teacher showed an example made by her husband, an architect. She favored a problem-solving approach to teaching.

To show that art was a serious subject like all the others, the teacher presented the students with a two-page handout that described 8th grade general art, goals and objectives, rules, art practices in the classroom, and grading. The handout also included a signature sheet for the parents to sign showing that they have received this information. Students would get five points toward their grade if they brought the signed sheet back to the teacher. The handout stated: "IN MY CLASS YOU MUST SHOW RESPECT FOR OTHERS AT ALL TIMES. I hope that you will learn to love art as much as I love teaching it."

Rules stated that no gum or food was allowed, students were to be in their assigned seats when the bell rang, there was to be no talking when a lesson was being introduced, stools must be pushed under the desk when leaving, no trips to the locker or water fountain would be allowed, the seat and desk area must be kept clean, and no late work would be accepted unless a student was ill. Students were expected to keep notes, do homework, and take tests and a final exam.

The approaches used most often to communicate art knowledge were the combined lecture/demonstration and one-to-one instruction. The textbook and the videotape methods were each used once and were the only times that the teacher sat down for any length of time. She was constantly on her feet, either going to each student and checking on his or her progress, demonstrating at the blackboard, or showing examples at her desk as students asked questions and searched for further clarification about the lesson.

What Knowledge do Students have about Art in General and the Specific Lessons that were Taught?

Information for this question was collected from 25 student responses to four questions on the questionnaire; four students were absent.

Art in general. To the question, What is art? the students responded with statements like: "Art is the different forms of lines, shapes, and sculptures." "Art can show emotion, art is creation, dreams, it is thought put in a picture." "Art is a way of expressing yourself without words in drawings, music,

acting." "Anything that is creative." "Art is drawing, craft, and anything that you do using your mind to make something for enjoyment." "Art is part of your life; art is contrast, music, expression, painting, drawing, sculpture, crafts, pattern, etc."

The question, What area, concepts, or ideas would you include in art? was answered in these ways: "Sculpting, painting, shapes, lines." "Dance, art, music." "Shapes, finger paint, copper painting, brush painting, one-point perspective, three-point perspective." "Everything." "I don't know." "Music, paintings, drawings, graphics, and movies." "Perspective points when you line the ruler up with the points so it will look like it's all straight." "More study of detail and still life designs."

The students answered the question, How can you tell good art from bad art? with answers like these: "Good art is good and bad art is bad." "To look at it." "Your eyes and your taste of art." "Whether they put a lot of effort into it and if it is neat." "The way it looks to me." "You can't." "Bad looks bad; good looks good." "When you see good art, you say 'Hey, that's nice' and when you see bad art you say 'Hey, that's really ugly'; also, you can tell if it's good if it's neat, and put together." "There's really no certain way; each piece of art is in a class to itself."

The students' responses to the questions, Who are some famous artists that you know about? What do you know about them? were, for example: "Leonardo DiVinchi and Piccaso and Michael Angelo (sic)--he did a famous chapel." "Leonardo (sic) de Vinci; He painted the Mona Lisa." "I don't know any." "Ken [Smith--a student], he's good." "I think my father is a good artist but he's not famous." "Pablo Piccaso (sic)--we studied him in elementary."

Specific lessons. This information came from student responses to two questions on the questionnaire. The question, What did you do in art and did you learn about it in elementary school? elicited answers like these: "We learned the different colors to mix to form other colors, lines, shapes." "Not much, we just did construction paper and drawing." "We didn't really discuss art in detail." "How to use my fingers." "We made masks to look like characters in the movie Star Wars." "We did drawings, painting, and stitchery." "We used hangers and panty hose and we cut out eyes and a santiclause (sic) hat with a cotton ball." (Student drew a diagram of how this was made.) "We learned that if you colored something darkly with crayons in different colors, and then colored over it in dark black crayon, and when you took a paper clip and grooved a picture out of the black on top of the crayon it showed contrast."

Responses to the question, What did you do in art and what have you learned about it in junior high school? were like these:

"A lot more because they trusted us with more materials." "One point--three point--shading--different lines--shapes." "In junior high we work with many things; we drew cartoon characters, we painted with tempra (sic) paint and watercolors, we did two and three point perspective, lettering, shading, still life, clay, copper relief, and matting copper relief." "In junior high I learned how to shade and how to draw patterns and I also learned how to always line the ruler up with the perspective point." "Still life, texture, pattern, design."

What Do Students Think about and How Do They Think While Making or Responding to Art?

The students spent their time in class almost exclusively on making art. Responding to the question, What do you think about while you are making art? they said, for example: "About the work on the board." "What I am doing." "People." "Nothing." "I don't think about anything but what I'm working on." "Everything." "Lots of things." "About what I'm going to do as my next step." "My homework, lunch, what I'll be doing later, and I listen in on peoples conversations." "Latest music and sex." "Is this my best or can I do better." "What your mind is telling you to do."

On another question, What is your strategy/approach to developing the art assignment? How do you go about developing your idea? Do you usually have a plan in mind before you start or do you plan it as you go along? they answered like this: "Have a plan." "I think of other art I have seen before." "No, it just comes." "Make it up as I go." "I make one thing and then I think of something else that would look interesting following it; plan it as I go along usually." "No because I just go along." "Do anything that pops in my head." "Before I start."

What Do Teachers Think about as They Teach?

The art teacher said the following in response to this question: "I try to be very careful not to say anything that's going to hinder their creating. Even if something looks terrible, I don't tell them that. I try to find something good about it and say well, why don't you bring this out a little bit, or this is a real nice area, why don't you do more work on this. And I just kind of ignore the bad parts and comment on the good parts, and try to suggest that they work more along that line. Negative criticism sort of stifles them."

Conclusions

This section of the paper will address step two and step three in the phenomenological method described in methods and techniques.

Structure and Configuration

Knowledge in this classroom had a variety of appearances. There was the "official" art curriculum, the "actual" art curriculum, the teacher's conceptions about art education, the students' conceptions about art, and various established school and classroom routines. These were all formal components in the interaction process of constructing art knowledge. Another important component that is informal or hidden, is the knowledge and curriculum that students construct around and alongside art instruction. This knowledge focused on building social relationships with other students and the transmission of many values and beliefs found in American culture.

Official art curriculum. The official art curriculum was structured with assignments rooted in the French Academy, the Renaissance, and the Arts and Crafts Movement. It was very traditional and reflected a time when artists/craftspersons were admired for their skills in rendering, drawing, and fabricating. The curriculum also focused on techniques, the use of various art media, learning some of their characteristics, and controlling them.

Actual art curriculum. The teacher's actual curriculum drew upon traditional assignments such as perspective and shading from the Academy system and copper tooling from the Arts and Crafts Movement. It was also technically oriented. A deviation in the actual curriculum occurred that is not evident in the official one. The teacher introduced a design problem in pencil that utilized lines, shapes, pattern, and shading. This assignment brought in theory underlying twentieth century concepts about modern art. This theory is Formalism in which the formal elements are used in relationship to one another according to the principles of design. The textbook, All About Art, supported a formalist conception of art. The text's view of art as a visual language possessing a grammar is rooted in ideas articulated by James McNeil Whistler, Roger Fry, and Arthur Wesley Dow. Lessons by the draw man on videotape included formalism and the idea of art as geometry. Art as geometry (e.g., ideas like God is the Supreme Architect; the Greek derived Golden Section) was a popular conceptual metaphor during the Middle Ages and the Renaissance that was revived during the nineteen twenties.

Teacher's conceptions about art education. Prevalent in the teacher's thinking were the ideas of "basics" and that art requires serious study. These ideas legitimated her choice of assignments, her approach to presenting lessons, managing her classroom, and her agenda for professional growth. They served as a ground for her concern about and sensitivity to the challenge of keeping the students involved in art.

The references in the course outline to the students' growth in various areas through art, developing creativity, and media exploration reflect the thinking of art educator Viktor Lowenfeld. The reference to developing sensory mechanisms through art, that is, one knows through the senses, is rooted in the nineteenth century Aesthetic Movement (the aesthetes Charles Baudelaire, Walter Pater, and Oscar Wilde) and Empiricism.

Students' conceptions of art. The students had a variety of views on art. A few found it irrelevant, and others held formalist, fine art, humanist, aesthetic, expressionist, and nihilistic views. All of these views are espoused in our society. In terms of knowing good art from bad art, the students mainly had a relativistic and personal view. This, too, is an idea that is pervasive in our society and is legitimated by the modern art movement. Some students were concerned about craftsmanship as a criterion for good art. This concern reflects an idea from the academy system.

What the students know about art appeared to be based primarily on their experiences in making art. The spontaneous approach they had to making art reflects a child-centered form of art education (e.g., Viktor Lowenfeld, Franz Cizek, and Marion Richardson) which puts responsibility on the child for developing imagery and working strategies. This method of teaching has much in common with creative problem-solving approaches used in university art courses, learning by doing, and learning by discovery.

Established routines. This component of knowledge in the art room included what to do with the materials being distributed, how to ask for help, how to turn in materials, tools, and assignments, showing absent slips, when to talk and when not to, and when to ask questions. Everyone knew that the teacher took roll, that you had to push in your stool at the end of class, that you shouldn't splash water at the sink, and that you should stay in your seat.

Hidden curriculum. One of the things not anticipated before beginning the study was the considerable amount of time students spent in social interaction that focused on their social lives and activities outside of school. A lot of "business" other than learning art was being conducted in the art room. One student stated: "My mom doesn't care about art because I may not use it when I grow up." Rock stars and concerts were the "hot" topics at hand. Boyfriends and girlfriends were perhaps the second "hottest." Attending to one's appearance seemed a close third.

The content of conversations included: movies, HBO movies, the rock group KISS, how to do a worksheet on poetry for another

class, a commercial on Entertainment Tonight, summer school, and insulting things to say about people who weren't your friends. Students were also concerned about cheerleading, basketball, who called who on the telephone, notes sent by other students, dances and what to wear, grades, parent visits to school, and tests. Attending to these things filled the spaces around the teacher's instruction and doing art projects. As one student said: "Art class is not work, it's mostly fun. It depends on who you sit with."

Reflexive Analysis and Critique

Of significance is the observation that the teacher conversed her way through the course as did the students. They each had different agendas, but these interlocked and overlapped. Together, the students and the teacher did indeed construct a course in 8th grade general art. This course may bear a resemblance to other 8th grade courses, but it was also unique in that no other persons experienced this particular version.

The art knowledge built up during the course was historically grounded and consisted of a multitude of metaphors and perspectives which reflected issues and problems that concerned our predecessors. These were taken for granted by the teacher and students. The range of knowledge in the student response was appropriate. Clearly, the concept of art is shown as both dependent upon human invention and grounded in human experience with the physical world. It is also evident that no one was compelled to structure a response or view in exactly the same way as another. Students appeared to have some choice in appropriating available views, metaphors, and knowledge, and building their own version of what passes for art. The students were not passive recipients of the teacher's interpretation and mediation of art knowledge, but actively engaged in organizing meanings and their own sense of things.

One problem is that the students did not have an opportunity to be reflective about their art experiences, their working strategies, the manner in which artists have worked, or viewing and criticizing art work. This problem is tied to the amount of time usually allocated to the teaching of art in schools and a possible public conception of art that denies it any cognitive status. Another problem is the role of the teacher as curriculum designer. Certainly, art teachers are able to design courses and curricula. In fact, they are generally responsible for doing so. However, in view of the time constraints of teaching five or six classes a day with possibly only one planning period, this can become a very heavy and time-consuming responsibility. More professional help ought to be forthcoming from universities, state departments of education, and professional associations. In other subjects, quite often textbook publishers provide this service.

Sixty years ago, it was fashionable to have textbooks of various kinds in art, K-12. Perhaps the idea is timely again and art teachers could have a variety of published materials made available to them that would organize and present current information about the visual arts for school use.

Educational Importance of the Study

This examination of teaching and learning as a sociology of knowledge problem has drawn upon theory that accounts for active learners with varied perspectives on art knowledge. The study has used a methodology that allows the investigation of meanings which remain inaccessible from conventional hypothetico-deductive methods. This study contributes to the growing body of literature concerned with studying teaching and learning in situ. Many studies have been conducted in the areas of reading, language arts, and mathematics. Little work has been done in the visual arts beyond Degge's (1976) ethnographic study of a junior high school art history class. Knowing about what happens in the art classroom and how teachers and students view what they are doing can, hopefully, lead to a quality experience for students in all of their classes.

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Footnote

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Art and Science in Technical/Rational Society

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The contemporary French philosopher Michel Foucault (1980) has recently observed:

> What has emerged in the course of the last ten or fifteen years is a sense of the increasing vulnerability to criticism of things, institutions, practices, discourses. A certain fragility has been discovered in the very bedrock of existence--even, and perhaps above all, in those aspects of it that are most familiar, most solid...(related to this) one in fact also discovers something that perhaps was not initially forseen, something one might describe as precisely the inhibiting effect of global, totalitarian theories.

This paper is concerned with two of our most pervasive and apparently reliable theories, those general accounts of the status of science and art which seem to form part, indeed a very large part, of the "bedrock" of contemporary thinking. In the first section an outline will be presented of what I take to be the most commonly accepted and highly legitimized general accounts of both science and art. No apology is offered for the sketchy nature of this treatment. The reason why what is offered here must take the form that it does is twofold. First, I do not want to lose sight of the central issues discussed here. Second, a fully adequate treatment of these topics would extend to many volumes. In the second section I will mention some serious problems with the accounts of science and art presented in the first. To the extent to which one takes those problems seriously one must, I think, reject the general accounts offered in the first section. A conclusion will follow. But "conclusion" is perhaps too strong, for part of the point of my argument is that we cannot, at this time, make what is conventionally thought of as a conclusion about these matters. We are forced to reject our previous notions and are enjoined to be cautious and tentative about any new notions with which we might replace them.

The Conventional Accounts of Science and Art

Though the most recent form of understanding in our culture, science is generally seen as the most successful. This is the Age of Science and that is not only because the technological applications of scientific knowledge have transformed our lives but also because science is identified with Truth. There are at least

three reasons for this, each closely identified with the other. They form the "bedrock" of the self understanding of scientists and of science's public evaluation. First is the notion that scientific knowledge is cumulative. Unlike knowledge in other forms (Hirst, 1974; Steedman, 1982), science does not simply discard the old in order to replace it with the new. Rather it builds on the old, theories succeed each other in a magnificent sweep of progress. So, at any given time a particular bit of knowledge, or even a major theory, can be found wanting (and refined), or even false (and discarded), but there is no waste. The great enterprise of science uses both its successes and its apparent failures to good advantage.

It can do so because of the second notion. That is that science has a method. Scientific knowledge is unlike other forms of knowledge because it is created in a particular way. Literary critics, historians and the like might wade in their shallows but the scientists can swim upon the sea of real knowledge certain of a special methodological guarantee. And not only is this method unlike others, it is also self-correcting. Just as the knowledge the scientist produces is endlessly self-adjusting (to "the facts") so is scientific method self-correcting. The key here is experimentation. The experiment ties theories to the world in such a way as to ensure both the self-correcting progress of knowledge and the progressive refinement of the tools of investigation. All this directs our attention to the third notion about science. It is that scientific knowledge is objective. The scientist as scientist does not let feelings, emotions, political or moral convictions and the like enter into the production of knowledge; science is value-free. Those literary critics and historians are endlessly caught up in the discourse of human experience, whereas science, (and here I mean physics and those other sciences which seek to approximate it methodologically and epistemologically), stands beyond human life, outside our time, and free of our concerns. Its language is that of mathematics, its truths are those of nature itself. Herein lies the origin of the great optimism which has surrounded science since the time of Galileo. For it has seemed, until quite recently, that science did really promise a brighter future. A "rational" world might come to replace the dogmatic culture of religion which held us in its grip until science released us. If things have not turned out quite as well as expected, it must be in no small part because this understanding of science is flawed, fatally so.

But, so too, I want to say, is our understanding of art. Here I do not have anything especially prescriptive in mind by "art" either. The person-on-the-street or "Dan Rather and the CBS Evening News" sort of definition is what I am talking about. The contents of most "Introductory Western Civilization 100" textbooks will do quite well. So I am including the Greek dramatists, Virgil, Dante, Shakespeare, Proust, and the like in

literature. Certainly composers like J. S. Bach, Haydn, Mozart, Beethoven, Wagner and Schoenberg would count in music. And in the visual arts there is an embarrassment of riches: Raphael, Leonardo da Vinci, Rembrandt, Cezanne, Picasso, and the list goes on and on. To it we should also add whole other lists like those of the great architects, potters, weavers, and sculptors. There is a gray area, of course. It is occupied by photorealists and the like. Andy Warhol might well represent those people. Their art is ambiguous; arguments can be mounted from either side for their inclusion as "artists" or not. There does not, however, seem to be much doubt, at least in my mind, about where those fit who submerge themselves in water, attack and mutilate themselves with sharp instruments, or dig a hole in a desert and then fill it in. Theirs will not count as "art." Why not? The explanation I want to offer is related to what has been said earlier about science. For I want to assert that the common understanding of science outlined earlier is the ideology of scientism. As such it serves a number of functions. The most important is to obscure the nature of science. But I will return to that point. Another is to delegitimize other types of knowledge. The (much misunderstood) norms of rationality within science itself thus become the norms of rationality. Knowledge which is not science is judged "irrational," or at best "less significant." This has happened in the case of artistic knowledge. So yes, I do want to claim that art does produce knowledge. If this seems counterintuitive, then it is worth remembering that for almost all of the history of this culture, from the pre-Socratics, it would not have seemed so. That it does, or even might, is the result of the action of another of those "totalitarian theories" Foucault mentions. It is part of our common sense understanding of the social world and of the place of art within it. It is our ideology of the aesthetic and it runs as follows. Art works, or "products," or "objects" are essentially at once psychological and private. This is true both in respect of their creation and their consumption. They may be used to ends which are not psychological and private but this is to vulgarize them. In essence they are expressions of the subjective state of their creators and are to be consumed in that way, too. "Consumed" here is seen as vulgar, too; art is to be appreciated. We stand in relation to works of art as potential connoisseurs. Our interactions with such objects should, ideally, produce an "aesthetic experience." And this is an experience essentially unlike any other we might have. On this general view of things, the content of the object is either not especially important or cannot be given a reliable analysis. Rather the formal properties of art works are discussed. We can at least communicate about form intelligibly, whereas content, being more psychological, is difficult or even impossible to say much about. This view of our interactions with art works cuts out social and historical contexts. The individual confronts the work. An interrogation of the work produces an aesthetic experience. The individual is altered in some respect, usually

"enriched." And this is all that can really be said about the matter.

On behalf of this general account of things a very big claim is made. It is that the discovery of the "aesthetic experience" has released art from its role as the servant of other pursuits and has given it an autonomous status of its own. I think this is, to at least a great extent, how things are now often seen. But I interpret and evaluate all this rather differently. For by "elevating" art to the realm of "the aesthetic," and simultaneously decontextualising it from other social concerns, it has become trivialized. Yes, art may have a status of its own, on this account, but it is also an optional extra in life, a frill. "You like Rembrandt, I like the NFL," and since the whole business rests on private, psychological "likes," there is not much more to say about the matter.

Confronting the Conventional

No significant field of knowledge has been more open to that "increasing vulnerability to criticism" than that of the status of science during the period Foucault referred to. It is not just that certain details of the sketch of science I have presented have been criticized but rather that the whole substance of it has come under the most radical revision. Individuals evaluate the persuasiveness of these criticisms differently and their implications are, of course, debated but there can be no doubt at all that the central core of our understanding of science now must be reevaluated. Let me show you what I mean.

The claim that science develops by accumulation has come under both logical and historical attack. Were science to do so, the problem of induction would have to have been solved. Karl Popper's (1968) attempt to do this, though perhaps the most cunning ploy since Hume defined the problem, is generally judged to be a failure. But more than this, a rival account of scientific development, one that is built from the very notion of discontinuity, has been advanced by a number of philosophers and historians. Thomas Kuhn (1970) has argued that science passes through discontinuous periods or paradigms and that what "truth" and "the facts" are at any time is paradigm specific. Paradigms are divided by periods of "revolution" when processes of "conversion" cause scientists to switch from seeing things in one way to seeing them in another. And worse (for the conventional account) even than this, we have no way to stand back from different paradigms and evaluate them. In other words, there is no "neutral" position from which to appraise rival paradigms; we cannot escape our own thinking and adopt "nature's own point of view."

Wedded to this logical insight is an historical one. Close examination of the historical record demonstrates that those historians who have written the canons of accumulationism have been writing the history of a fantasy. People did not abandon Ptolemy for Copernicus and Galileo because of "the evidence" any more than did Einstein begin work in relativity theory because Michelson had convinced him to abandon Newton. Accumulationism is a logical impossibility and an historical fantasy. The objectivity of science fares little better under critical scrutiny. If there is no fully rational way to switch from one paradigm to another, nor even to evaluate such switches after they have taken place, then what is to be said about our fundamental commitments to any particular paradigm? In order to see how such switches or conversions are made we need to look beyond science itself. And this is a dangerous thing to do, for it calls into question another of the most basic tenets of the ideology of scientism I have identified. Basic to the conventional understanding of science is the notion that it has a life of its own; that its affairs are not those of economics, politics, ethics, and the like, but rather that it has its own "internal history" based on its own "logic." But, as a matter of fact, this is not the case. No worthwhile description of the history of science can succeed without reference to the social, economic, and political contexts in which it has developed. It is just these contexts which provide the grounds for paradigm switches. So what we can say about any particular switch is something like this: given that you are committed to principles a or b (perhaps the maintenance of the peace of mind of the faithful, or the technical control of nature) you would be well advised to support paradigm a' or b' (perhaps Ptolemaic celestial mechanics, or that of Galileo). The point is that science itself cannot make such a choice for us and choices, whatever they may be, can only be evaluated as to their rationality within contexts beyond that of science.

It will probably come as no surprise to you that I have little that is good to say about the idea that science has a distinctive or unique methodology, one which gives its products a special status. Paul Feyerabend (1975), for example, has shown in both historical and philosophical studies that scientists use <u>any</u> methods that work. And "work" here gets redefined as the enterprise goes along. There is no "magic key" to the universe, no tried and true mechanical methodology. Indeed, just the reverse is true. Scientists muddle along like the rest of us with guesswork, hunches, suppressed "failures," and a lot of very hard work. But why shouldn't there be a "method"? Just because science is so discontinuous and disorderly, because its problems and questions change, because, above all else, it is a human enterprise. The idea of "a method" may be (superficially) attractive but it is an illusion, the sort of idea we invent to comfort ourselves (Brown, 1977; Chalmers, 1982; Hacking, 1983).

My evaluation of this ideology of scientism is, predictably, a rather stern one. To the extent to which I have identified a real and basic understanding of science which has widespread currency, (and not merely a caricature), then we need, as a society, to think again about our commitment to what is, I think, a new religion. Ironically, this is not a situation in which we need the courage to say, "Look! The Emperor (science) has no clothes," but rather to admit that the Emperor is rather differently attired than we had thought. Science is a much more interesting enterprise than the ideology of scientism would suggest. It is also more exciting, and for reasons just like those I mentioned earlier.

Just as radical a change is needed in our understanding of art. I think the private, psychological "aesthetic experience" account of things is just as much a totalitarian theory as was the ideology of scientism. It is time that I laid my cards on the table in respect to art. Notice that I have been using "art" throughout rather than "the arts" which is, these days, more normal. There is a reason for this: it is that I think art is unified by a basic concern with morality. That is not to exclude many other of its concerns. Art objects, like just about any objects, can be interpreted in many ways. They do have psychological dimensions but then so do other things, including scientific theories. They can give rise to especially intense experiences. But again, so can all manner of other things. As for "aesthetic experience," I must confess to not being able to find out just what that is supposed to mean. My friends tell me that, as an ex-music critic, I used to make my living from them. That may be true, but so far as I can see "aesthetic experience" is certainly not a very useful idea. Art, properly understood, presents us with the means to make moral interpretations. I am assuming here that moral questions are basic in human life and that we approach them in different ways. Art provides one of the most potent of these ways. There are certain morally significant facts about life, like, for example, the fact that we are mortal, we will die. Left on its own, such facts are meaningless, they require interpretation. We make sense of them in various ways; art is one of these, indeed it is one of the most important. Art provides machinery to think with about our most fundamental concerns. The very greatest works of art become paradigms of such thinking. The deaths of Antigone, Dido, Cordelia, Siegmund and, more recently, Benjamin Britten's Peter Grimes and Patrick White's Mordacia Himmelfarb are the very matter by which the social world understands itself. We see in them, in abstracted and symbolic form, elements of our own experience. But more, they help us, by continuously interpreting that experience, to create and recreate ourselves as moral beings. It is not as if the proper metaphor here is that of the mirror; we do not simply see ourselves in art. Rather, art provides a sort of x-ray of our experience. This is part of what Kenneth Clark (1969) meant when he quoted Ruskin as follows:

> Great nations write their autobiographies in three manuscripts, the book of their deeds, the book of their words and the book of their art. Not one of these books can be understood unless we read the two others, but of the three the only trustworthy one is the last.

Not a Conclusion

It would seem to be quite easy to complete this paper as follows. I might say something like: we have two totalitarian theories, ideologies of scientism and the aesthetic. The first gives a false status to the nature of science and turns it into a religion for us. The second trivialises art by making it little more than the instrument of our culture's growing narcissism (Lasch, 1979, 1984). Clearly, armed with this sort of critique, we should attempt to knock science off its perch and elevate the evaluation of art to something more appropriate given its moral nature and potential social importance. The trouble with such a conclusion is that one wants to know how it might be done. In order to answer that question we need, for a start, to look carefully at how things came to be as they are. This could be legitimately attempted in a number of different ways. My way is to ask: What sort of a society would produce these misunderstandings of the nature of knowledge in science and art? Asked in that particular way, a very illuminating answer is reasonably clear--a technological society.

Technological society needs to delegitimize certain modes of discourse and legitimize others. One might say that it needs its own religion and has found it in a positivistic understanding of science. For science, so conceived, is the ideal articulation of our estrangement from nature. Nature is, by this account, a passive realm which we may simply control. The earlier Greek notion of nature and our part in it as a set of organic, meaningful relationships has been quite overwhelmed by, and replaced with, that of positivist science. Co-extensive with this has been the delegitimizing of the moral discourse which was part of an earlier picture of such things (Steiner, 1961). It is as if, in a technological society, there are certain sorts of questions which really cannot be asked. 'Does it work?' or 'Is it efficient?,' makes sense in our world, whereas, 'Is it good or just?' does not quite.[1] The scientising of psychology has increasingly taken ethics out of the consideration of human life as well. Not only is nature seen as something to be manipulated, so to an increasing extent, are we ourselves. Technological society demands that human beings themselves be seen as machines, or, at the least, as machinelike. Psychological-technical discourse has increasingly replaced moral discourse in the consideration of human affairs. It is as if art really has no place in our technologized world.

What I have been describing here is a disaster, a social one. Right at the time when technological "progress" has brought us new problems that we find especially baffling, like those of the environment and the redefinition of our most basic understandings of ourselves, it has, simultaneously, helped to cut off our access to one of the most potentially important means by which such problems can be considered, through art.[2]

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Footnotes

[1]I owe this way of formulating the matter, and a good deal besides, to discussions with Patricia Amburgy.

[2]A useful extension of parts of this argument is offered by John Gardner (1978) in his On Moral Fiction. New York: Basic Books. Gardner and I are in fundamental agreement about many matters, but also disagree about many.

Preschool and Third Grade Children's Development of Drawing Strategies to Represent the Perspective of a Three-Dimensional Model

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The purpose of this study was to investigate the development of young children's ability to represent a three-dimensional object on a two-dimensional surface when drawing from observation. Previous research has suggested distinct age differences in children's approaches to problems of representation. A well-known example is Clark's (1897) study in which children, ages 6 to 16, were asked to draw an apple with a hatpin passing through it. While the hatpin was drawn as a continuous line across the apple by the younger children, the tendency to show only those visible parts of the pin which were sticking out the sides of the apple increased with age. Research by Lewis (1963) and Lewis and Livson (1967) of elementary school children's drawings of a cube indicated that spatial relations were shown with increasing clarity with increasing age. Another illustration is Freeman and Janikoun's (1972) study of children's drawings of drinking cups that were positioned so that the cups' handles or flower patterns were either visible or not visible. Their research indicated that younger children included defining features (the handle) in their drawings even when not visible, whereas older children included only visible features, even if not defining. Other examples include the research of Willats (1977), Colbert (1984), and Smith, Fucigna, and Goldsmith (1984). All of these studies investigated young children's observational drawings of three-dimensional objects, illustrated age differences in representational skills, and utilized spatial representation as one dimension for examining and explaining children's drawings.

Several theoretical positions have been developed supporting distinct developmental sequences or stages in representational skills (Crook, 1984). One long accepted explanation still influential today is that children draw what they know rather than what they see. As a result, when drawing familiar objects, young children include defining features, such as the handle on a cup and the door on a house, even if the feature is not present or not visible from their point of view (Bremmer & Moore, 1984). Similarly, in drawing groupings of objects, young children often will segregate the objects on the page, frequently using horizontal or vertical page placement to indicate spatial placement and depth. This may be done even if the objects are behind one another and not visible or only partially visible from their view of the object array.

Luquet (1927) described this approach as "intellectual realism" and said that it characterized drawing until children were 8-9 years old. After this age, children begin to draw what they see, an approach referred to as "visual realism" (Bremmer & Moore, 1984). These same labels and similar explanations were adopted by Piaget and Inhelder (1956) in discussing drawing in relation to cognitive abilities.

Recent research has broadened the explanations of development in children's representational skills. Barrett and Light (1976) found that the definition of intellectual realism was unable to distinguish between children's drawings of specific objects and drawings based on their understanding of more general classes. Barrett and Light distinguished intellectual realism, knowledge of a particular object, from symbolism, knowledge of the properties of a general class, and theorized that representational development may proceed from symbolism, to intellectual realism, to visual realism (Barrett & Light, 1976; Bremmer & Moore, 1984; Crook, 1984).

An additional explanation also has been offered by Light and MacIntosh (1980). They suggested that young children may depict array-specific views rather than their own viewpoints when representing visual displays of several objects because they consider this the best way to relay information about the actual spatial relationships of the objects. Thus, according to Crook (1984), development may be seen as an increase in the relative importance of portraying one's own particular view, as opposed to portraying array-specific views.

Along similar lines, well-defined development stages have been questioned. Research has illustrated that young children can be prompted into omitting hidden features and producing view-specific drawings (Bremmer & Moore, 1984; Cox, 1981; Crook, 1984; Davis, 1983). Though not often used, it seems that young children have many of the skills required to produce view-specific or visually realistic drawings (Bremmer & Moore, 1984).

Bremmer and Moore (1984) indicate that the research implications do more than offer further insight about intellectual realism. Conventionally, the change from intellectual to visual realism has been thought to show development in the child's ability to include information on the page. "The current interpretation is that young children simply do not choose to produce a view-specific drawing, probably because it is less informative about the model" (p. 376).

Taking a different approach to explaining representational development, Freeman (1980) has focused on the problems involved in representation and the strategies used by children in solving them. Freeman argues that the child would need to understand four things to draw, "even crudely," in perspective: knowledge of the active

role of the observer, the abstract idea that the best way to explain a scene is to rescale its appearance, a grasp of measurement and geometry, and the structure of space (p. 209).

According to Freeman, children use drawing "devices" and "systems" for representational problem solving. Devices are approaches used at local points of difficulty in a drawing. Systems are overall plans for representation. Rather than viewing development as conceptual stages or levels of perceptual differentiation, Freeman explains development as the growth of discrete drawing devices and the transition between systems to solve representational problems (p. 206). Drawing devices for spatial representation are segregation, enclosure, hidden line elimination, and interposition (p. 223). Drawing systems for spatial representation, following Dubery and Willats (1972), are described in terms of type of projection and compliance of alignment cues (p. 221). Five systems discussed by Freeman include: orthographic projection, horizontal oblique projection, vertical oblique projection, oblique projection, and linear perspective (p. 212-213).

The present research is concerned with the representational strategies used by young children and extends a study of preschool children's drawings reported by Colbert (1984). This study follows Freeman's approach in examining production strategies used by young children in drawing. Specifically, the study describes the strategies used by preschool and third grade children to represent spatial depth when drawing a three dimensional model from observation.

Several additional factors influenced the present study. An "unfamiliar" object was constructed to use for the drawing stimulus because of previously reported effects of children's stereotypes on their drawings. The drawing stimulus was constructed as one object with pattern and detail and solid projections, in order to provoke children's consideration of occlusion and hidden features in the context of the same object. Spatial representation was used as the dimension to examine the drawings because it frequently has been used in developmental research, thus providing a reference point for consideration of the findings.

Method

Subjects

The subjects for this study were children enrolled in university early childhood learning centers and public school third grade classes in the Southeast and Midwest. Subjects represented three racial groups (Oriental, Black, and Caucasian) and the numbers of males and females were approximately equal.

The ages of the 70 preschool subjects were 4:2 to 5:6 years. The ages of the 20 third graders were 8:5 to 9:5 years.

Materials

The model used as the drawing stimulus in this study was a 3 inch (8 cm) balsa wood cube with a triangular solid top attached. Solid rectangles of varying sizes were attached to the faces and edges of the cube. The model was painted white. Black and white detail, including alternating black and white stripes, dots, lines, checks and a diamond, were added to the all-white surface. The model was small enough to be hand-held, manipulated, and examined prior to drawing.

A black felt tip pen or pencil and white drawing paper measuring 8 1/2 x 11 inches were used by children to draw the model.

Procedure

Each child was tested individually in a small room adjacent to his or her classroom or in private, controlled areas of the classroom. During testing the child and the researcher sat at a small table with the model placed on the table about 1 1/2 feet from the child. The model was placed with one corner toward the child so that two sides were visible. The same placement was used for each child.

The researcher talked briefly with each child to establish rapport and then handed each child the model. The following instructions were given: "I brought an object that a friend of mine made. Please hold it and look at it carefully. Turn it over and around."

After each child examined it, the model was placed on the table in the original position to give each child the same point of view for drawing. The researcher then gave paper and a pen or pencil to each child and asked the child to draw the model: "I want you to draw this object. Look at it very carefully. Draw it the very best that you can."

There was no time limit for drawing completion. Approximately one hour was spent by the researcher with each child during the individual testing procedures. The researcher recorded the approaches used and the verbal comments made by each child during the individual testing procedures. The researcher did not give evaluative comments about the drawings as children progressed but did encourage children to complete the task. Two 4-year-old children did not complete a drawing of the model.

Results

The drawings were analyzed by the two researchers according to strategies used to represent spatial depth. Two sources were used to determine categories: previous research, particularly work by Willats (1977), Freeman (1980), and Lewis (1982), was reviewed to determine previous systems of classification. The drawings were reviewed to insure that categories would reflect the data.

Each drawing was assigned to one of nine strategy categories defined below and diagrammed in Table 1. The precentage of drawings from preschoolers and third graders in each of the nine categories is shown in Table 2.

Strategy Categories

1. Segregated detail. Drawings consisted of notations of detail and pattern from the model. These were not organized spatially by contours of the model, as no outline or single face of the model was drawn. Detail and pattern were segregated from the model and each other. Spatial relationships were indicated in some drawings through horizontal or vertical arrangements.

2. Single plane with segregated detail. An enclosed shape was drawn to represent a single face of the model. Detail and pattern, if drawn, were segregated from the model face in their placement on the page.

3. Single plane with integrated detail. A single face of the model was represented by an enclosed shape approximating a square. Detail and pattern were drawn inside the enclosed shape.

4. Segregated planes. Two to six faces of the model were drawn but were unattached.

5. Single plane with triangular solid attached.

6. Two or more attached planes. At least two faces of the model were drawn and sides were attached. This included square faces of the cubical base of the model and front and side faces of the triangular solid. Neither obliqueness nor occlusion was used.

7. Two attached planes with obliqueness and/or occlusion. At least two faces of the model were drawn and attached. Obliqueness and/or occlusion was shown.

8. Three attached planes with obliqueness.

9. Three attached planes with obliqueness and occlusion.

Drawings representative of each category are shown in Figure 1.

Table 1
Strategy Categories for Depth Representation in Drawings of a Three-Dimensional Model

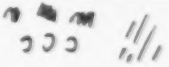
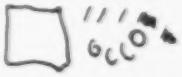
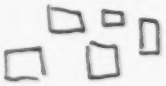
Strategies	Representative Characteristics
1. Segregated detail	
2. Single plane with segregated detail	
3. Single plane with integrated detail	
4. Segregated planes	
5. Single plane with triangular solid attached	
6. Two or more attached planes with no obliqueness or occlusion	
7. Two attached planes with obliqueness and/or occlusion	
8. Three attached planes with obliqueness	
9. Three attached planes with obliqueness and occlusion	

Table 2
Percentage of Use of Strategies for Depth Representation in Drawings of a Three-Dimensional Model

Strategies	Percentage of Preschoolers' Drawings	Percentage of Third Graders' Drawings
1. Segregated detail	9%	0%
2. Single plane with segregated detail	13%	6%
3. Single plane with integrated detail	11%	6%
4. Segregated planes	13%	0%
5. Single plane with triangular solid attached	24%	44%
6. Two or more attached planes with no obliqueness or occlusion	17%	0%
7. Two attached planes with obliqueness and/or occlusion	13%	22%
8. Three attached planes with obliqueness	0%	11%
9. Three attached planes with obliqueness and occlusion	0%	11%

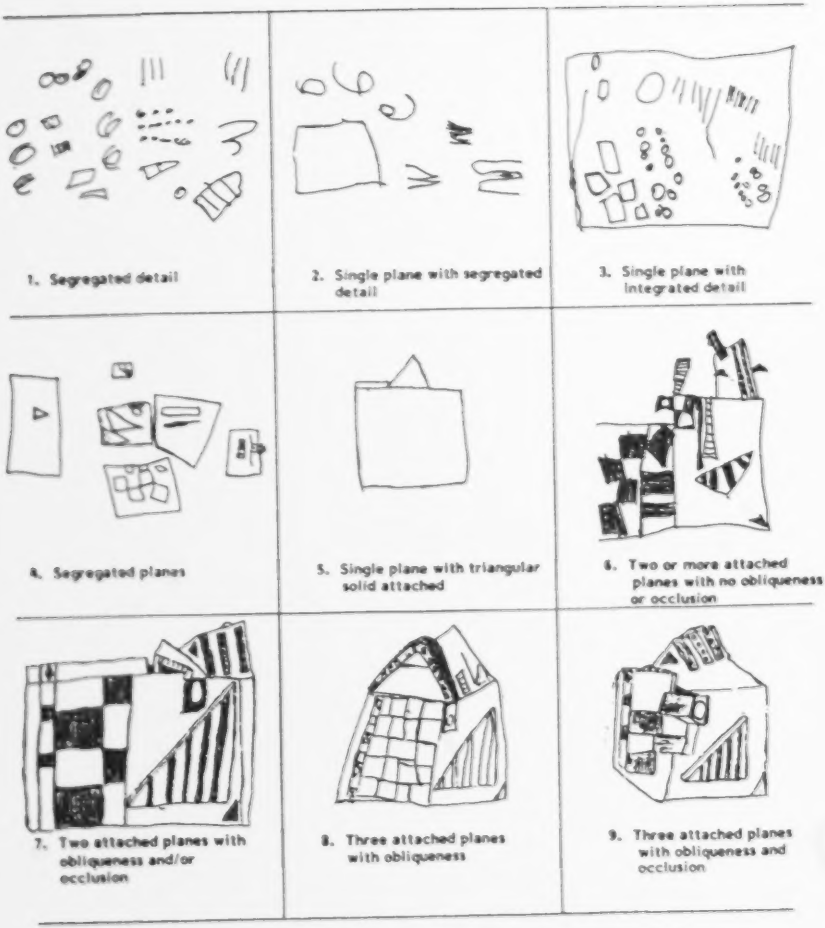

1. Segregated detail
2. Single plane with segregated detail
3. Single plane with integrated detail
4. Segregated planes
5. Single plane with triangular solid attached
6. Two or more attached planes with no obliqueness or occlusion
7. Two attached planes with obliqueness and/or occlusion
8. Three attached planes with obliqueness
9. Three attached planes with obliqueness and occlusion

Figure 1. Representative drawings of strategy categories.

Discussion

The results of this study illustrate the variety and complexity of strategies for representing spatial depth possessed by young children between 4 and 9 years of age. The types of drawing devices and systems used by the children in this study were not unexpected, as they were similar to approaches used by children which have been isolated and examined in prior research. However, there were three findings that were not anticipated: the 4- and 5-year-old children's range of available strategies and their use of sophisticated depth conventions, the ability and willingness of almost all children to draw a complex object from observation, and the similarity of strategies used by the two age groups.

As noted in Table 2, the drawings by preschool children showed use of seven strategies to represent the model. Strategies 1, 2, and 4 are based on the use of segregation and total 35% of responses, which is in line with the results of previous research. Strategies 3 and 5, seemingly representing only one plane, total 35% and suggest a kind of middle ground in terms of view-specific and array-specific representations. Strategies 6 and 7, totalling 30%, show an awareness of a defining edge and second plane, the beginning of an ability to render a three-dimensional form and the space it occupies (Smith, Fucigna, & Goldsmith, 1984). Such a response is not typical in preschool drawings and according to previous research, not expected until age 8-9 (Lewis, 1982; Cox, 1978; Freeman, Eiser, & Sayers, 1977). Our findings indicate that relatively sophisticated conventions for representing depth are available for some children at an early age and that some children are flexible enough to employ these strategies dependent on the drawing task.

A second unexpected finding was that, with the exception of two 4-year-olds, all children were willing to draw the model and seemed comfortable with the task. They seemed to understand that what was being requested was a drawing of the particular object. The children were curious about the model and intent in their drawing efforts. They were able to handle the object, draw, and make visual checks for information. Many asked to have a second turn at drawing it in the future.

Children handled the difficulty of the task in a variety of ways. Several children used the model as a stimulus for developing elaborate scenarios, using verbal and graphic methods to extend their drawing of the model into a composition. While doing this, the children indicated an awareness that their actions deviated from the requested drawing task. In effect, they took the specified task and reconstructed the problem for themselves. This

could be attributed to drawing difficulties. However, all of these children initially began with an adequate, unelaborated, representation of the model.

Another unexpected result was that 78% of the third graders' drawings fell into the same categories used by the preschool subjects. The change in strategies was not as profound as might be expected given the age differences. While the drawings were examined in terms of the representation of spatial depth for this study, it is possible that some children may have set a different task for themselves, that of showing the character or details of the model, rather than spatial representation. Again, it is an example of children defining the task and focusing on what they felt most important. Similar results have been noted by Lewis (1982), Smith (1983), and Freeman (1980).

Moreover, when the drawings are examined from a more general standpoint, there are qualitative differences in the drawings of the two age groups. Line qualities, ability to show pattern and detail, care in coloring in solid areas were much more finely tuned in the older children's drawings.

Developmentally, the results of this study indicate that a range of strategies for depth representation is available at an early age. Such availability calls to question discrete stages in drawing development and suggests that if stages do exist, they must not be considered stable and exclusive. It also indicates that task structure by the researcher and task definition by the subject play a significant role in the types of drawings produced by children.

In conclusion, it should be noted that asking an individual child to observe and to draw from a three-dimensional model is not a study of teaching or of making art. It is a study of the development of children's representational skills. Most research in this area has been done by developmental psychologists interested in child development. Graphic representations, like speech and motor activities, give evidence of physical, cognitive, and perceptual development. The early studies reported by Lewis (1963), Lewis and Livson (1967), and more recently Smith (1983), are some of the few research efforts addressing the link between this research and development and teaching in the visual arts.

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Observation Drawing: Changes in Children's Intention and Translation Methods Grades K-6

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Drawing directly from observation has been an accepted component of studio practice in art for centuries. Yet it is infrequently taught to children, particularly younger children, in this century. This is perhaps because educators think children cannot benefit from it.

It is widely believed that drawing from observation is self-evidently a process of transferring perception directly to paper, of making a replica of the optic array; and, that the outcome of this process must be illusionistic if carried out skillfully. Since children do not make illusionistic representations it is assumed they have failed in the attempt. This supposed failure has generated various responses. Psychologists have explained it by attributing children's lack of verisimilitude to their desire to draw what is known rather than seen (e.g., Luquet, 1917), to their not yet fully developed mental imagery (Piaget & Inhelder, 1969), or to their immature perceptual system (Gibson, 1971). Teachers, sensitive to the warning of Lowenfeld (1957) and other respected art educators against interferring with children's natural methods of working, have avoided offering observation drawing.

The premises behind this rationale need examination: first, is observation drawing truly the direct transfer of perception to paper; and second, is children's drawing a failed attempt to illusionism?

Regarding the relation of perception and drawing, scholars in psychology (e.g., Arnheim, 1974; Freeman, 1980; Goodnow, 1971; Werner & Kaplan, 1963) have argued that representation involves translation from the perception of experience into the form of a medium. The characteristics of a medium limit and define what shall be represented and how it shall be represented, as do the characteristics of systems that drawers follow while moving through the drawing process. Thus, in terms of the physical nature of media and the psychology of working processes, drawing cannot be simply a replica of perception.

In art history the notion of painting as a direct record of perception is at least as old as the tale of birds pecking at the grapes that Zeuxis had painted. The discovery of linear perceptive together with the writings of Alberti, Vasari and others during the Renaissance reinforced this view. More recently, Gombrich (1960) presented an extended account of progress in Western art as a never

ending search for perfect representation, in which each generation of artists revises the work of earlier generations *by matching it* against nature.

However, the sociological function of art is ignored in this view. An alternative was advanced by Panofsky (1924-25) who interpreted linear perspective as a symbolic form appropriate to and communicative of the spirit of Italian Renaissance humanism. In a volume contrasting Dutch seventeenth century realism with that of the Italian Renaissance, Alpers (1983) explains that in the north the word "perspective"

> rather than referring to the representation of an object in respect to its spatial relationship to the viewer, is taken to refer to the way by which appearances are replicated on the pictorial surface. Perspective in this sense is concerned with the representation of what Poussin called aspect. (pp. 51-52)

In the north, perspective was a system directed at recording surface textures and appearances and presumed an aggregate of views recorded from a moving eye, not a system, such as the Italian, based on one unmoving eye for selecting and ordering forms in space according to the judgment of the artist. Thus, even so-called "scientific" perspective systems differ and reflect the values of the cultures in which they flourish.

Thus, the premise that observation drawing is inherently a replica of reality may be refuted on the psychological basis that drawing involves processes of translation into a visual medium, and on the historical basis that these processes are different depending on cultural time and place. With this realization, drawing cannot now be understood as failed replication. We must rephrase our second question, to ask: what are children's translation processes and their intentions regarding the reality to be depicted? In order to examine this question we need to study what children select to draw, and how they draw when they are taught to observe carefully and to search for the meaningfulness of objects, and are not, at the same time, taught linear perspective (or any other system of translation). The study that follows is an initial effort in this direction.

The Study

The Teachers and Children

Five teachers[1], their classes of children, and the investigator constituted the working group. The teachers were from different school systems in the greater metropolitan area of a large eastern city. Two of the teachers were team-teaching four to five

year-olds in a university affiliated nursery school. Two others taught elementary art, one in an affluent community, the other in a less affluent suburb. The fifth taught art to grades three through six in a school with many children of low socio-economic status, but in an affluent community.

The teachers were selected because, in the view of the investigator, they were outstanding teachers and shared a humanistic philosophy of art education. They believed that the authentic and meaningful quality of images that children make is directly related to the depth of personal thought involved, and were committed to teaching skills and concepts to increase children's ability within this context. Invited to participate in a curriculum development project, they agreed to meet as a group and carry out lessons with their classes for one school year. They did this as volunteers, simply for the knowledge to be gained, stimulation, support, and the opportunity for exploration and exchange. The investigator participated on the same basis.

The Working Process

The role of the investigator was to coordinate meeting arrangements, to participate in and tape-record discussions, to provide written synopses of discussions, to find and transport drawing objects, and to photograph children's work. Meeting once a month, the group quickly fell into a pattern. After sharing a meal, notes from the last meeting were distributed and discussed. Then one or several teachers would put out all the drawings from a lesson. These were examined at length, both individually and as a group, the teacher supplying anecdotal information from the actual teaching event. Toward the end of each session there would be discussion of what lesson ideas members might like to try during the next month; these would have emerged from analysis of the drawings and the discussion, or they were brought in by members. Often discussions were inconclusive or open-ended. Members might or might not return with examples of lessons that had been discussed the previous month. This working process emerged in the first several sessions and it quickly became clear how appropriate it was for this particular group. They were skilled and sophisticated teachers, each with her own unique teaching style, very interested in the task, and much stimulated by each other's work and observations.

While there was no overall planning of subject selection, lesson ideas, instruction strategies, or content, there were two goals: to teach observation drawing with attention to (a) the meaningful quality of both process and product and (b) to offer no systems of translation. In addition it was assumed that drawing should be taught with attention to development.

The art teachers taught the lessons in their usual classes varying from 15 to 25 in number, generally meeting for art once a week for a 40 to 50 minute period. All classes included boys and girls. Each curriculum in art was studio centered and included experiences with a variety of materials and activities. The kindergarten teachers taught observation drawing on a flexible schedule and sometimes used it in connection with science or social studies.

Organizing the Information

After the school year was over the investigator studied the assembled notes from meetings and photographs for evidence of changes in relation to age, in children's intentions regarding what to depict and in translation processes. During this process, subcategories were found within each major line of inquiry (see Tables 1 and 2).

Those sub-categories found relevant to intention were choices children made regarding the object or subject to be drawn, the type of image produced, and emphasis on stylistic or formal features. Objects were considered on the basis of their familiarity, and whether they were intrinsically or visually interesting. Images fell into three types: (a) discursive, those that told a story; (b) fantasy, those that depicted the imaginary; and (c) figural, those that described the object itself. The intention to control for stylistic features involved emphasis on particular kinds of line, shape, pattern, texture, and so forth.

In the examination of translation processes two subcategories emerged: (a) basic object definition, and (b) the third dimension. Each of these was considered in terms of the child's conception of what information to represent (perceptual-cognitive) and the means (graphic elements) used to represent it. The concepts traced in regard to the third dimension were mass, space, and point of view. Other methods of studying translation processes appear in Colbert (1984); Lewis and Livson (1967); Light and MacIntosh (1980); Smith, Fucigna, and Goldsmith (1984); Willats (1981).

Natural groupings were observed in the children's behaviors and interpreted as ceiling effects; these effects resulted in a clustering of grades one, two, and three, a similar clustering of grades four, five, and six and the kindergartners maintaining a separate grouping. These clusterings were a result of similarities of performance within each grouping.

Table 1
Changes in Children's Drawing Intentions

	INTENTION		
	Grade: K	Grades: 1, 2, 3	Grades: 4, 5 6
Object			
Type	Familiar	Familiar and less familiar.	Familiar, less familiar, and social.
Interest	Object itself.	Object itself.	Visual qualities per se.
Image			
Discursive	Few. The self	Few. The self.	Few. The self, the group.
Fantasy	Few. Fear and wishes.	None.	Few. Fears, wishes and humor.
Figural	Many. Objects without space.	Many. Objects with base-line. Part of an object.	Many. Several aspects.
Form/Style		Motion, pattern, geometric shapes.	Motion, pattern, geometric shapes, texture, line, shape, interval, composition.

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Table 2

Changes in Children's Drawing Intentions

	TRANSLATION					
	K		1, 2, 3		4, 5, 6	
	Perceptual-Cognitive	Graphic Elements	Perceptual-Cognitive	Graphic Elements	Perceptual-Cognitive	Graphic Elements
Basic Object Definition	1a. Generic: most salient parts or structures: details.	Most similar basic shapes or marks (line or dot) assembled unit by unit.	2. Generic: silhouettes of salient parts: details.	Single contour line.	3. Specific: silhouettes of masses: details.	More varied single contour lines.
	b. Generic: salient parts or structures: more details.	Modified basic shapes.				
Third Dimension						
Mass	Part masses.	Flat basic shapes.	Part masses. Front and top/side planes of objects.	Flat basic shapes. Joined basic shapes. Merged contour line shapes.	Part masses. Front and top/side planes of objects.	Flat basic shapes. Joined basic shapes. Merged contour line shapes.
					The spatial orientation of planes.	Up/down curving contour lines. Diagonally oriented lozenge shapes. Areas of lighter & darker value (light).
Space	Recession.	Occlusion. Decrease in size.	Recession.	Occlusion. Decrease in size.	Recession.	Occlusion. Decrease in size.
Point of View	Single aspects or faces of objects.	Most similar basic shapes.	Single aspects or faces of objects.	Most similar basic shapes. Contour line shapes.	Single aspects or faces of objects.	Contour line shapes.
			Several aspects or faces of objects.	Joined basic shapes. Merged contour line shapes.	Several aspects of faces of objects.	Joined basic shapes. Merged contour line shapes. Orthogonals.
					Note: A unified system of orthogonals based on the concept of a single unmoving station point was not present.	

Drawing Behaviors

Kindergarten

Intention

The kindergartners were interested in drawing relatively familiar objects that had some intrinsic interest for them such as an animal or a tricycle (see Table 1). They were interested in the living and doing reality of the object, how it functioned or lived, not in its formal visual qualities. For example, when presented with a pheasant that had been stuffed and mounted for a museum the children wanted to know how it died, where it lived, and how it got to the classroom.

They drew objects in three different types of images. Many drawings were objective figural descriptions, a few were discursive narratives and a few were fantasies, either of a wish or a fear. Among the objective drawings, only the object itself was represented: it was not located in space. Exceptions were occasional drawings that included another object which formed part of the immediate context such as the log upon which a grey squirrel had been perched in mounting or the glass cover encasing an animal.

Discursive drawings included indications of the space and other objects in an event being described (e.g., the trike being ridden outdoors) as did the fantasy images.

In translating the subject into the graphic medium, kindergarten children seemed to understand the task of definition as one of selecting the most salient features of the generic form of an object. When asked, prior to drawing, for the parts of an animal their replies included main salient features such as head, body, neck, tail, and continued with specific details such as beak, webbed feet, and claws. They asked what the beak, feet, and (false) eyes felt like. Their drawings included the loon tail very short, the pheasant tail very long, the loon beak long, the pheasant beak short, and the black and white contrast of the loon's markings. The structural arrangement of most salient parts and details was appropriate if the structure of the object was simple. The complicated arrangement of narrow interconnecting tubes in the tricycle apparently caused children to add or subtract elements and to connect them in imaginary arrangements.

The children's drawings of the play yard are particularly instructive. The subject prompted the children either to select one item from the space, or, if choosing to represent the place itself, to select salient features to identify it by. Those choosing a single object (e.g., the climbing structure) also included ground lines as part of the subject, an exception to the

general omission of base lines. Those representing the place included the large tree at the top of the hill, the hill silhouette and surface, and the fence or climbing structure. Since the surface of the hill is difficult for a kindergartner to represent, it must have been a salient feature for the children, solid and a plane on which to climb to the top.

Translation

It appears that the basic method of translation for this age is identification of salient features and selection from a vocabulary of basic shapes and marks (circle, rectangle, triangle, stick-line, and dot) of the shape most like the shape of the feature (see Table 2). Adjustment is then made for relative size from one feature to the next and the basic shape units joined, more or less where the features join. Many children used this method but two other methods were observed.

One of these involved modification of basic shapes. Some children began to inscribe more specific shapes such as the angular ovoid of the loon's head or its sharply pointed, triangular beak. In this mode of translation unit is still joined to unit but the shapes are more articulated.

The other, not typical of this age group, was the single contour line around main features. This occurred in two quite different drawings. In one, the child attempted to render the silhouette of the pheasant in one unbroken line with swellings for body and diminutions for tail and neck. In another, a drawing of the school yard, one unbroken line flowed along the silhouette up the side of the hill to its top, from thence up one side of the tree, down the other, and continued along the ground down the other side of the hill. The drawing process in both appears to have been one in which the child moved a pencil together with her eye traveling along the silhouette. In the animal drawing it seems but an early example of a usual technique. In the play yard drawing because the line continues across elements with different identities it is startling and suggests that this approach to translation may be the result of an unusual individual preference.

Masses were rendered by flat shapes in this age group, but recession in space was indicated by occlusion (pheasant babies partially hidden behind their mother's feathers and the hill behind objects in the play yard). In addition there was decrease of object size from front to back in play yard drawings.

There is no indication of a point of view or station point in these drawings. There are side and front aspects of animal faces but no organization of orthogonals in a system indicating a single unmoving eye as is the convention in linear perspective.

Grades One, Two, Three

Intention

As reported by their teachers, children in these grades were interested in drawing a wider variety of objects than the kindergarten children, but still curious about them for their living and functioning rather than visual qualities (see Table 1). They could address a much more complex motif (e.g., sections of the school exterior built in a modern style). They also drew animals, a bike, automobiles, and shoes. A few drawings are in the discursive mode (e.g., bike with rider, going up a jump-ramp; girl in front passenger seat of a van labeled "club wagon"). There were no fantasy drawings in this age group, an unexpected absence with no apparent explanation. Most were in the figural mode. Among these some did suggest a spatial surround using symbols developed in the discursive mode such as baseline, trees or sun. Indication of location entered the drawing intention of some children. While still clearly differentiating observation drawings from narrative drawings they began to consider the spatial context of the object. There were no attempts to render space in detail, however.

A new intention begins to be apparent during this period: drawing with an emphasis on a particular element of design. In one drawing, a bike becomes the basis for a decorative or patterned design, in another the quality of movement in the bike wheels becomes a stylized blurring; in another the school facade becomes a careful selection of geometric shapes; the details of running shoes are developed into patterns. Animal drawings emphasize pattern and texture as feather shapes are drawn in a decorative group or dots mingled with sweeping pencil strokes in a rendering of feathers.

Translation

The subjects continue to be identified as species though now silhouettes of the mass of their salient parts rendered as single contour lines are also a means of translation (see Table 2). One line renders head, neck and body of loon and pheasant; another the sloped windshield, rounded rear and half circle fender openings of a Volkswagon van. Inscription of a line based on a silhouette of the object is a dominant mode though some children continue to render salient parts as basic shapes.

There are more details included and more means of indicating them. They may appear as basic shapes (e.g., a door handle as a circle); as modified basic shapes (e.g., car rear view mirror as a rectangle with rounded corners, or as individual silhouettes (e.g., bicycle seat as heart or leaf shape). They may be rendered as distinct lines (e.g., a grid of lines as a tile wall), or as grouped indistinct lines (e.g., repeated bushy lines as feather texture).

The proportions between details are more varied (e.g., small chimney-pot between larger windows with small mullions all above a very large window). It appears that parts are grouped in units hierarchically and that it is possible to plan both spatial location and size successfully. Objects are rendered by a single contour line with the body parts belonging to an integrated whole rather than being a group of items touching each other more frequently.

With respect to the indication of mass on a flat surface it appears that children begin to translate the separate but coexisting and touching facets of an object during this age grouping. They begin to include a top or side aspect together with the front of an object. This may be done by the joining of basic or modified basic shapes: for example, front and side aspects are joined along their common edge in drawings of the school building; or it may be done by the merging of shapes, as in a contour line that bends around the back and up the side of an automobile, indicating side and back faces of the car simultaneously with one shape.

Drawings of running shoes are very interesting in this regard. Quite a few depict the opening at the top as well as the side. It appears that children found both hole and side silhouette salient features of a shoe. So inclusion of two aspects may be a consequence of defining the subject, nevertheless the presence of two aspects inclines the viewer to read mass. In addition, the shoe silhouette sometimes leads children to produce contours that curving upward can be read as moving back into space by the viewer.

In sum, this particular subject probably led children to include the opening as part of the defining task and then allowed easy merging of aspects, offering a strong impression of three dimensional form to the mind of a viewer. The subject invited indication of front and top surfaces and a flow between them.

Fourth, Fifth, and Sixth Grades

Intention

To the earlier interest in objects for their own sake is now added an interest in them because of their social value as group symbol (e.g., cigarettes), and also an interest in objects purely for their visual qualities (see Table 1). Children now find subjects such as vegetables and room corners interesting for their shape or spaces per se. The subjects drawn by children in this age grouping included: animals, bicycles, toys, classmates, school interiors and exteriors, vegetables and flowers.

A few images were discursive (e.g., the class drawing the sea turtle) or fantasies (e.g., the sea turtle as an armoured car smoking a cigarette). A combination of discursive and fantasy

imagery occurred when one teacher asked a class to make drawings of a toy in an imaginary setting. This produced examples of humor typical of older elementary children (e.g., large skate and foot surrounded by Lilliputians in "Giant Land," dynosaur attacks city as people on many floors of skyscraper cry "Help!," extravaqant hat wearer drops bag of eggs carried on top of the hat). However, most drawings were figural.

Focusing on formal properties as a main intention is very apparent in this age group. Textures and patterns are rendered in greater detail in animal, vegetable, school, and classmate drawings. The school interiors demonstrate subtle choices of interval and the breakup of the paper space into interesting shapes. There is refinement and attention to shape and paper space. The shapes of the vegetables are enscribed with attention not only to salient features but also to the flavor of lines defininq contours and to the visual interplay of shapes. In occasional instances the exciting tension between lines that move beautifully across the surface and at the same time imply the curving of forms in space is produced. In fact, not only can many children enscribe single line contours but some are beginning to let those outlines disappear at the edges of darker shapes, thus making the perception of mass easier.

Translation

It appears that much detail is now possible (the elaboration of parts and subparts on bicycles can be extraordinary) as the ability to group information in hierarchies and process longer chains of information grows. Definitions include salient features as well as many, many details. The limits in these children's drawings seem to stem more from lack of practice at intensive looking than in translation difficulties. It also appears that some children were less able to observe or use their observations because of superficial understandings of linear perspective.

The single line contour becomes more varied. In addition, a single contour line inscribing the silhouette of grouped masses, as in the human figure, invokes a perception of structure in the mind of the viewer. Such drawings do not have the lack of internal coherence that basic shape drawings do and often a line of movement seems to flow through figures.

The simpler drawings of this age group include a number drawn with modified basic shapes, though more details are included in them than appeared earlier. Others are built on one or several contour line shapes. In these, occlusion may be accompanied by indication of mass as well. Mass may be implied by lines that curve upward on the paper such as those for collars and belts or by trapezoids with diagonal axes to suggest aspects or facets oblique to the picture surface.

There are side, front and three-quarter views of sea turtle and loon; close, middle and far views of the school exterior; and objects cut in half as they disappear off the very well composed page. Thus, the idea of aspect has passed from the selection of the communicative surface of an object to the selection of grouped aspects that communicate mass and distance. However, none of the drawings reveal an organized system of orthogonals indicating that these children have not yet conceptualized the station point of linear perspective.

Thus, many different approaches to observation drawing were noted. Among intentions, there were various subjects (familiar, less familiar, socially approved objects and visual-formal qualities) and types of image (figural, fantasy, discursive, and formal). The translation techniques included: use of basic or modified basic shapes to represent salient parts of a generic definition of the object, use of a single contour line to render its silhouettes and finally use of the same graphic techniques to render an individual object. The mass of an object was translated as a flat shape, as several aspects rendered by joined basic shapes or by joined contour line shapes, as contour lines curving upward or downward at their ends, as diagonally oriented lozenge shapes, and finally, by lighter and darker areas suggesting light on a form.

Recession in space was indicated by occlusion, decreasing size and the use of orthogonals. However, there were no examples of a systematic use of orthogonals. Thus, there was evidence of a variety of translation processes without the use of linear perspective.

Implications

As discussed earlier, psychology teaches us that representation is not a replica of perception but its translation into a graphic medium. In addition, history teaches us that pictorial realism changes depending on time and place. Italian Renaissance illusionism, 17th century Dutch and 19th century French realism are different from each other both in choice of subject matter and in terms of translation systems. Finally, it is important to remember Bryson's (1981, 1983) point that images evoke acts of recognition that construct ever-changing realities. For all these reasons, artistic drawing from observation should be understood as searching for meaning and for methods of translation.

The same processes are carried out by children in a developmental rather than an historical context. Within a developmental frame of reference it is possible to look for a variety of modes in children's intentions and translation processes. In this study a number were found, thus establishing that there is a plurality

and also identifying some frequently used modes in these children's work. With further study our understanding of the range and types of modes may be amplified and verified.

A number of pedagogical implications devolve from the study. First, observation drawing should not be omitted from curricula; translation into graphic language is possible for children.

Second, what we ask of artists is some revelation of their empathy with objects, some responsive insight into them. Children have empathy and insight and can be offered opportunities for using them within the context of a careful search for meaning in observation.

Fortunately, there are precedents in fine art training where students are consciously taught to seek intuitive as well as intellectual knowledge of the subject or motif. In the introduction to a drawing text Goldstein (1973) very eloquently describes one approach as follows:

> All drawings motivated by the wish to inquire and experience--whether they are interpretations of observed or envisioned subjects--are responsive. They are all founded on our intellectual and intuitive judgments about a subject and its organized expression on the page...
>
> Here responsive refers to our perceptual, aesthetic, and empathic interpretations of a subject's properties that hold potential for creative drawing. In responsive drawing, comprehending a subject's actualities precedes and affects the quality of our responses. Such drawings do more than recall what our outer or inner world looks like. They tell us what our intuitive knowledge informs us it is. (p. xi) (All emphases by the author.)

This search for meaning can only take place if and when teachers promote and welcome variety in intention. Since children used different types (discursive, fantasy, and figural) in these drawings, such types may be welcomed and encouraged. In addition, children can be offered suggestions to explore further, as they draw responsively; they may find modes other than these.

Third, children may also be encouraged to seek different processes of translation; to identify salient attributes and basic shapes, subshapes and contours, the continuity between surface and edge, or other modes. The goal of variety in translation raises specific questions regarding whether, when and how linear perspective should be taught in elementary school. Linear perspective is part of the western artistic heritage and should be shared with children. However, extreme caution should be exercised in offering

it to students who are not able to conceptualize it as a system. While occlusion and diminution in size with distance were found in the work of children as young as those in kindergarten, work implying systematic conceptualization of a single point-of-view or station point was not found in this study. Some older children appeared to be using elements of linear perspective and creating less observant drawings. It is very easy for perspective to become authoritarian dogma and thus interfere with the search for meaning. Linear perspective should not be taught apart from direct observation and not as the single correct way to draw representationally. Needless to say, there are many practical considerations that make it difficult to accomplish this.

Conclusion

Observation drawing is part of our artistic heritage and is appropriate for elementary school children. In fact, it can be an important component of curricula devoted to the discipline of art. This is a time in art education when the need for rigor is being emphasized. Such emphasis is long overdue; as we turn away from earlier laisser-faire practices, we must be careful not to run headlong into equally distructive authoritarian practice. Observation drawing can be rigorous without being authoritarian, if it is responsive drawing--a consistent search for the perceptual, aesthetic and empathetic meaning of objects and events.

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Footnote

[1]The author wishes to thank the participants for their sensitive and sustained work on the project and to make note of their further work on observation drawing which continues to this time. The participants were Loraine Cicchetti, Neighborhood Arts Center, Boston, MA.; Peggy Clark, Newton Public Schools; Carole Fuciqna and Marge Kennedy, Tufts University; Barbara Traietti, Bookline Public Schools.

What Children Draw or Do Not Draw From What They Can or Cannot See: Implications for Teaching Art[1]

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My response to the papers in this symposium depicts my theoretical perspective as graphically as children's drawings depict their visual perspectives. Both reflect the same conditions: our particular perceptual and educational experiences. I respond both as an artist and as a teacher of art.

Art education literature traditionally tells us that young children are incapable of drawing what they see, although the problem may be an incapacity to see what they draw. Children's drawings become more "realistic" as they grow older. Many art educators assume that children work toward achieving photographic realism. Many adults, especially those without an education in the visual arts, assume that representational images are the highest form of art.

Given what we know or do not know about what children draw or do not draw from what they can or cannot see, I address the issue of what adults should or should not teach them about art. I begin by reminding us all of what adults do most consistently in art if they lack instruction as children: nothing.

Because of my background as a painter, I bring to my response certain assumptions about the nature of the problem these researchers have addressed. Drawing real objects while observing them is a basic artistic activity, and a complex one. All representation includes interpretation. Nonartists tend to regard a photograph as a representational standard although photographs are only one kind of image, with limited representational features. Two-dimensional images that represent a real object, made by adult artists, may range from one that looks "so real you could touch it" to one so abstract that the object is unrecognized by many observers.

Drawing real objects while observing them is an artistic activity well suited to empirical study and one not often addressed by researchers. All three papers agree that features of children's drawings often diverge in noticeable respects from the physical features of the objects they represent. They all indicate that the degree of divergence lessens as children grow older. They all hope that studying children's images drawn from observed objects will provide some insights into what children of various ages can or will represent graphically. They all imply that drawing ability mirrors conceptual development: children's drawings are indices of physical, cognitive, and perceptual status. All are assumptions with which I concur.

The symposium title suggests that comparing children's drawings with the observed objects should add to our knowledge about making art. Children, however, are not artists; and they do not make art. They are small human beings who, if uneducated, will not even grow up to be artists. Without experience in the visual arts, that is, without either informal or formal art education, children will grow up to be like the majority of our society--adults who possess little knowledge about art and too few technical skills to make it.

Research studies like those presented today therefore contain important implications for teaching art. Knowing that "spatial invariants [are] easier to pick up from pictures than from real world objects" (Beyer & Nodine, 1985, p. 4) or that young children have "a variety and complexity of strategies for representing spatial depth" (Colbert & Taunton, 1985, p. 7), can and should fundamentally change what we teach children and adults about drawing; we need more information like it. The last body of research to affect art education came from the Gestalt psychologists, and art instruction has not changed much over the intervening three-quarters of this century.

Children learn to make visual images, and they learn to appreciate art. Children's drawings reveal educational status just as they reveal developmental status, although few contemporary researchers take that fact into account. Research that reports what children can and cannot draw is useful in understanding emerging artistic behavior, and therefore is useful in teaching both children and adults to draw. Research that reports what children prefer to do is not educationally useful, in my opinion, especially if it leads to the conclusion that "it seems inappropriate to base curricula on any fixed formulas of content or technique" (Smith, 1985, p. 19). Art education, by my definition, includes both.

The visual arts constitute a cumulative body of knowledge passed formally or informally from teacher to adult. Although the concepts involved are visual, they are as real as those in more commonly understood academic subjects. They should be taught to all children throughout their years of general education.

An art curriculum should be based on the four disciplines of art: aesthetics, art criticism, art history, and the making of art (Greer, 1984). The content of instruction derives from the subject, not from the learner. Mature art and mature aesthetic behavior are the final standards for artistic performance. Children cannot arrive at "fresh meanings" (Smith, 1985, p. 19) without a basis for comparison.

Children's artistic behavior or level of artistic sophistication at any given time depends upon two circumstances: age (or level of maturation) and experience (or level of knowledge and

skill). Growth occurs independently of education, and determines the amount and kind of artistic learning that can occur. Teaching can improve the knowledge base and perceptual skills without which no child or adult may understand or make visual images.

Conditions of Learning

Within the four art content areas, children should achieve levels of artistic knowledge and skills similar to those learned in other modes of thought and expression. Successful art teachers should produce visible changes in children's artistic behavior. The key to achieving artistic sophistication is the systematic presentation of art learning activities, sequenced from simple to complex, just as in other school subjects.

What is simple for a 12-year-old, however, is complex for a child of 6; simplicity and complexity relate to age. The degree of sophistication that teachers can aim for and the speed with which it occurs depend on the capabilities of students to manipulate tools and ideas. Whenever empirical research refines our understanding of children's perceptual and representational abilities, it moves us toward the refinement of teaching strategies.

Teachers who adopt a developmental approach to art education assume that children's artistic talent unfolds as children mature, and keeps on doing so until they become adults. These art teachers supply their students with materials and opportunities for creative expression, giving assistance only when children request it in order to avoid inhibiting or discouraging potentially talented youngsters from fulfilling their artistic promise. Because behavioral norms are actually unschooled norms, they lead art teachers to relatively low expectations for children's educated artistic performance at all grade levels.

Although we know that some students have more aptitude than others for certain tasks, we expect everyone in our society to read, write, and compute at a minimal level, and we instruct them in how to do so. When asked to draw a man or woman, however, most adult Americans produce figures that look in many respects as though they were drawn by preadolescent children (Rush & Shumaker, 1982). Because we do not expect all adults in our society to draw, as we expect them to write, or to read pictures as we expect them to read magazines, we have an adult population whose mediocrity in art is seen as acceptable behavior.

Children and Representation

Children begin to look at and produce visual and plastic images at a young age if they find tools, materials, and examples at hand. Children also depict objects while still quite young.

Most early graphic learning is informal. Children left to their own devices, however, seldom spontaneously reinvent principles of linear perspective or other esoteric but commonly employed visual artistic concepts.

With education or directed practice, children, like adults, can produce more sophisticated artwork. Whether children consciously work toward realism depends primarily on how adult observers define it. Most researchers (present company excepted) are not artists and they misuse terms like photographic realism (Selfe, 1983), use inadequate visual examples, and interpret children's drawings with an artistically uneducated eye (Rush & Lovano-Kerr, 1982).

Even small children employ visual and graphic alternatives, if they are available. In drawing real observed objects, achieving congruence in proportion and detail and representing three-dimensional space on a two-dimensional surface are only some of many artistic options open to artists. Teachers can and should provide children with representational alternatives. Once those are part of the children's repertoire, teachers can and should encourage children to use their full vocabulary of artistic concepts in their drawings.

Are children's drawings expressive? What about the drawings of untutored adults? Expression depends on skill and conscious choice; children and adults without real perceptual and graphic alternatives are unable to choose. Lack of skill may look like adult artistic expressionism, but is quite different.

Children's images display the current state of their artistic knowledge, just as images of adults do. Although adult art and children's artwork look different, both depend upon sensory, formal, expressive, and technical properties to convey aesthetic content. Children cannot become artists in the adult sense because they are immature, and their images reflect their more restricted understanding and their more rudimentary manipulative skill. Many artists nevertheless admire the work of children because of their direct, ingenuous solutions to graphic problems the artists themselves face.

Serious art study increases children's artistic knowledge at all ages, and enhances their artistic prerogatives for personal expression. Empirical research, such as this body of work on drawing from observation, is indispensable to establishing consistent, effective instruction in art. I would like to ask our researchers to consider some questions, however, as they pursue their investigations. Is there, as some of them say, no right or wrong way to represent observed objects? Are some images more artistic than others? What is a typical drawing of a child at any given age? What is a typical drawing of an adult? What aspects of a drawing are interesting to an artist, and what to an observer of the artist's product? Does our focus of interest change as we look at art?

Because we have taught so little so inconsistently for so long, we have few realistic expectations for what children's potential art abilities might be. With earlier, better, more focused art education, could children demonstrate more proficiency in drawing than they do at present? The answer can only be yes.

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Footnote

[1]Paper presented in response to the Arts and Learning Sig Symposium: Children Drawing From Observation--Theoretical Perspectives and Implications for Art which included the following presentations:

Beyer, F. S. & Nodine, C. (1985). A developmental study of intellectual realism in pictorial representation.

Colbert, C. B. & Taunton, M. (1985). Preschool and Third Grade Children's Development of Drawing Strategies to Represent the Perspective of a Three-Dimensional Model.

Smith, N. R. (1985). Curriculum Research in Observation Drawing.

An Argument for Social and Moral Arts Curricula

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The arts have traditionally been viewed as a pleasant but not particularly valuable addition to the school curriculum, and rather harmless, as long as "real" work is accomplished first. Historically, it is easy to see how the importance of the arts has been limited by our Puritan heritage and by the need to tame the American wilderness (The Arts, Education and Americans Panel, 1977). My concern is to understand some of the reasons that the arts in education seem to have remained so insignificant. I will explore hidden dangers of some common ways of thinking about the relationship between arts education and society, and suggest a vision through which the arts might become more significant.

In looking at the literature, it would appear that there is no lack of support for arts in education. Dewey (1934) and Read (1958) are particularly well known advocates. More recently, even the authoritative voices of the National Commission on Excellence in Education and the College Entrance Examination Board have published their support (cited in Working Group on the Arts in Higher Education, 1984).

Eisner (1972) presents a framework for looking at various claims for the validity of arts in education, pointing out that there are two major arguments, the contextualist and the essentialist views. The contextualist begins by determining the needs of the child, community, and nation. Within this argument, major justifications for art education are preparation for use of leisure time, contribution to mental health through self expression, development of creative ability, development of academic concepts, and improvement of coordination. Although Eisner does not argue that art education accomplishes these goals, he finds them insufficient to justify art education. Rather, he ascribes to the essentialist position--that art makes unique contributions to a person's experience and understanding of the world. Under this argument, he justifies art education in that art provides a sense of the visionary in human experience, activates our sensibilities and capacity to respond, allows us to see both the ordinary and the extraordinary with a fresh vision, helps us find meaning in our daily experience, generates cohesiveness among people, and enlarges our consciousness. Eisner arques that it is important to take a subject centered, essentialist approach to art curriculum, rather than a society centered view, and bases his position on the fact that the former is a stronger argument, stating: "if it [art] is justified in educational practice...on grounds that are <u>not</u> unique to art, it has no more

claim to educational support than any other field that claims to make the same contributions" (1972, p. 63).

In looking to practice, it appears that arts education has accommodated a wide variety of goals and values in society. The arts have been enlisted as a tool for teaching various academic skills and concepts; in fact, this was indicated as one of four major purposes for the Dance Component of the Artist-in-Schools program (National Endowment for the Arts, 1979). When career education became popular, data on the availability of jobs in arts and arts related fields was gathered in support of arts training programs. My own field of dance has been enlisted in support of a national emphasis on physical fitness, and is losing its integrity as an art form to become a means for exercise. Over and over again, in trying to market the arts to schools, art educators seem to have focused on how they can support the goals of society that are already established in schools.

I wish to suggest that a major reason the arts have remained trivial in education is that we have attempted to fit the arts into existing values and practices of contemporary schooling. In everyday practice, our determination of whether or not something fits is ordinarily based upon a mechanical understanding. We look for fit by asking such questions as: Is there a place for it? Is it the right size? In other words, we do not question the overall structure of the larger whole into which the smaller part will fit. We look for a space the right size and shape, and expect to make only minor adjustments, at best, in the larger structure. Another characteristic of mechanical fit is its goal of efficiency of production: as long as the machine works for its intended purpose, we need not examine its parts.

It is in this sense that we seem to be trying to fit the arts into schools. Children do tire from intensive academic instruction, and recreational activities are necessary if they are to be renewed for more--and thus, here is a place the arts can fit. Schools are expected to prepare students for careers and there are career opportunities in the arts--here is another place the arts can fit. Children can learn cognitive skills and concepts through movement, drawing, acting out, and other activities in the arts--here is another place the arts can fit. Other ways of fitting the arts include: development of the feeling aspect of the self (which is ignored in most other subject areas), thus making for a whole child; improving discipline; making school more enjoyable (which helps in increasing attendance and reducing dropouts); and development of understanding of other cultures.

These, indeed, are ways that the arts do fit into schools. But there are major problems when the arts achieve this kind of fit--one is what happens to the arts and the other, which is related, is what does not happen in schooling.

In my own state of North Carolina, where the arts are mandated as part of the curriculum, they are practically invisible in the state's program guide and competency goals and indicators. Just as we may cut off the end of a screw too long to fit into a machine, we conveniently trim off parts of the arts that do not fit--goals that do not fit into outline form, objectives that cannot be worded in behavioral terms, activities that will not fit into a 25-minute slot twice a week for six weeks. The machine of schooling turns out the same basic product, with only an additional, admittedly small, component of arts education attached. It is like trying to cover up a flawed manufacturing process by adding a little glitter to the final product.

If we use the arts to relieve the tedium of schooling, as a reward or a break or an incentive for attendance, we may turn the arts into a means of temporary escape from a difficult and unpleasant reality, a moment of anesthesia that allows us to tolerate that which we ought not tolerate. If the curriculum is dehumanizing, we should change it rather than use the arts to make it more bearable and to get students to attend school. Otherwise, we are teaching students that the arts are a way to avoid being touched by the problems of the everyday world, problems which they should avoid rather than confront.

In addition, this orientation may all too easily emphasize only those dimensions of the arts that are "easy" and "fun." Significant art does not deal merely with pictures of hearts and flowers, with plays and dances and songs about happy feelings; it deals also with what is difficult, ugly, and fearful. Further, it takes as much energy and concentration to do significant art as to do important work in other areas. If we emphasize arts experiences that are merely pleasant and relaxing, we are contributing to their lack of significance in people's lives.

Lying hidden in each of the ways the arts fit into schools are similar problems worth examining. If we regard arts in education as career preparation, we may easily ignore students who do not have potential for such a career. If we rely on the arts to provide the feeling dimension in education, we may be reinforcing the mind-body-spirit split, with feeling becoming relegated to the arts instead of being acknowledged as a dimension of all knowing, and we may ignore the valuable cognitive dimension of the arts.

An emphasis on improved discipline may lead to instructional methodologies which foster student passivity. The arts, just as any other area of the curriculum, may be a place where teachers encourage doing what one is told more than thinking for oneself, staying in the lines more than expanding the boundaries. Ideally the arts improve discipline by helping students understand what it feels like to attend and concentrate, and recognize the satisfaction of using self-discipline to create something worthwhile. But it becomes

harder to see this depth and detail of discipline as long as the machine of schooling is working efficiently.

Another admirable goal involves use of the arts to help students come to understand different people, cultures, and the world around us. The arts can do this. However, when we become concerned about mechanical fit and efficiency of production, it is far too easy to make arts experiences merely another item on a checksheet of objectives or assignments. I wonder, for example, if it may be worse to have students think they understand African culture because they have learned one dance and made peanut stew, than it is to recognize their ignorance of a rich culture.

None of these problems of course is beyond the reach of skilled and sensitive teachers. But in order to develop these skills and sensitivities, we must look beyond the goal of achieving a mechanical fit between the arts and schools.

Eisner proposed that a stronger justification for arts in education is not based upon needs of society that can be accomplished as well by other activities, but upon the essential nature of art itself. I share Eisner's view that we must start out thinking about art education not by looking to what society needs, but by looking at what art is. However, I choose this view not because it makes a stronger case for arts education (which it does), but because I think the other choice not only trivializes art education, but also reinforces dimensions of schooling that ought to be changed rather than tolerated. Even though the starting place for arts educators should be the nature of art itself, we must not ignore the relationship of arts education to schooling and of art itself to the larger society. As artists we must be concerned with art itself, and hold it truly to what it is, in its greatest significance. As arts <u>educators</u>, we must also be concerned with the social context of the arts and arts education. These are not conflicting positions.

Let us start, then, with the starting place--what is the nature of art? It is surely a central question in the preparation of arts educators, and is not one to be easily or quickly answered. Rather, it is worth pondering throughout one's career as an arts educator, based upon one's own experience of art as well as the literature.

One important dimension of this question has to do with whether we focus upon art as a product or as an experience. If we look to the art product to understand the essential nature of art, we are primarily concerned with recognizing the aesthetic qualities to be found within the art object--grace, wit, or expansiveness, for example. Redfern (1983) refers to this as the "objectivist" view. Such a view may enhance our consciousness, but only, I think, our consciousness of art. There is nothing to indicate that it will

ever move beyond itself. I find it significant that Eisner defines the contributions of a subject centered approach to art in much larger terms than only making and understanding art works. Rather, he indicates that the art experience will contribute to a particular way of living in and responding to the world--a way characterized by vision, consciousness, and sensitivity. If we focus on the experience of doing art, we may see that its essential nature includes not just transformation of art materials, but transformation of persons.

However, we must recognize that the experience of art is not uniform. Hirschman (1983) noted three different kinds of experiences which may arise in various activities commonly deemed to be aesthetic. These activities included both performance (playing or singing music, dancing) and observation (of movies, plays, concerts, and dance performances, as well as reading a novel or story). The three types of experience she looked for were aesthetic experience (deep involvement in the experience), escapist experience (helping one to escape problems, pressures, or unpleasantness), and agentic experience (analytic interest in its development). She found all three forms of experience among the different activities, although different activities were more likely to result in certain experiences than others.

I have difficulty with the use of the arts to escape unpleasantness. I do, however, acknowledge that the arts may offer us an alternative reality far more pleasant than the everyday, and that such a reality may be a significant source of nourishment and knowledge of possibilities. As Marcuse (1978) has noted, a journey to the transcendent dimension may put us in touch with our inner resources--passion, imagination, conscience. And then, because the arts exist also in the everyday world, the aesthetic experience may return us able to see more clearly, feel more deeply, respond more sensitively. But, if the focus of the arts experience is escaping from unpleasantness, I question whether it enhances our consciousness of the everyday world. The transcendent experience itself is so satisfying that, instead of returning us to the world with renewed sensitivity and vision, it may all too easily seduce us into believing that the imaginative world is all that that there is, or all that matters. I find this as problematic as the belief that the here and now is the only possible reality.

There are other ways, too, that the arts experience may diminish our consciousness. There are many instances in which art has been used for propaganda, or to so stir groups of people emotionally that they lose their sense of individual responsibility for their own actions. Further, as Berger (1973) points out, art does not present the truth, but rather a particular way of looking at the world, a particular view of reality. If we look to artists (and art critics) as authorities, which we often do, we may fail

to recognize our right to interpret our own reality; art thus becomes a route to loss of consciousness.

Thus, we must take care in generalizing the nature of the arts experience. The arts may be a unique way of understanding the world, giving us a fresh vision, activating our sensibilities and capacity to respond, but they may also be a way to escape from the world, pleasing us simply because of what they take us away from, and making us more able to tolerate that which we ought instead try to change. The arts may also dull our senses, or anesthetize us to our responsibilities as persons in the world. Simply presenting the arts--as an activity for creating, performing, or observing--may well not provide the very significant contributions indicated by Eisner and others. If arts education is to accomplish the kind of relationship with the world that the essentialist position proposes, then we must look with a very discriminating eye at the arts curriculum, being aware of both its dangers and its possibilities.

Greene (1978) proposes that some art works are more likely than others to enhance consciousness of what it means to be a person in the world. She notes that certain works of art are considered great because of their capacity to bring us into conscious engagement with the world, into self reflectiveness and critical awareness, and to a sense of moral agency, and that these works of art ought to be central in curriculum. Selection of content is a critical issue facing arts educators.

I am not proposing censorship or manipulation of students to attempt that they have only the kind of experience through the arts that we wish them to have. As Rader and Jessup (1976) note, some aesthetic experiences may touch our lives deeply, and others may have scarcely any personal or practical reference. Both are a part of art. We cannot control the arts experience for students, nor should we attempt to. However, we can and should become aware of our own values, and not allow those most significant dimensions of the arts experience to be buried or ignored through lack of our own awareness, or through an attempt to fit into schools. We can also raise the critical faculties of students, to help them become aware that the arts may be a means of enhancing their consciousness or dulling it, and that the arts can be used to manipulate or deceive us just as they may help us become more sensitive and responsive.

Questions about the nature of the arts experience are not disassociated from questions regarding its social and moral context. Both rest on common ground--on our vision of what it is to be human, and how we might live in the world. It is the search for vision and the attempt to give it form that have fueled both the most significant art known to humankind and the most significant moral thinking and social endeavors. It is this search that takes us inside

ourselves--to imagination, passion, and conscience--and beyond ourselves--to discover our connection with other forms and other life. It is not that arts education should lead to moral behavior, but that the root of both ought to be the same. If such a root--the search for what it is to be a person in the world--were central in education, we might well expect a flowering of both moral action and meaningful artistic expression.

And, while I do not view art as an agent for moral instruction and social change, we must be aware that, whether we like it or not, art bears a relationship to society. Not to be aware of the relationship means that we give up our power to choose what that relationship might be. Arts education may be in a relationship of tacit support for the status quo, or one concerned with possibilities of what might be. It may lead persons to see only their power to create images on paper or movement on a stage. Or it may help them see connections with their lives as persons in the world--that imagination, creation, and transformation may be extended beyond the boundaries of classrooms, studios, and theatres.

This implies that arts educators must become aware of their own vision, must examine questions of their own humanness and their relationship with others with whom they share the world. Those who wish to teach must study not only their content area, human development, and educational psychology. They must also study themselves, reflect upon who they are as persons, define and redefine their values in dialogue with other voices.

It also implies that the arts curriculum should consist not only of creating, performing, and observing art. It must also include opportunities for reflection, for expanding consciousness beyond oneself and one's art into the larger world of which both are a part.

I cannot suggest such guidelines for curriculum and teacher preparation without acknowledging that they make the arts less likely to fit into contemporary schooling. When artistic vision is not conveniently contained in the room at the end of the hall, when it is concerned more with transformation than adjustment, arts education may lead to questioning of the assumptions and values of schooling. Instead of fitting into schools, the arts may reveal and illuminate; new forms of schooling, and new forms of art, may be created in the process. To be willing to view arts education in this way means that arts educators must also be willing to deal with concerns far beyond the arts curriculum and the personal satisfaction of doing and perceiving art. To resist such thinking means that arts education is likely to remain a trivial ornament in education.

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Relationships between Writing and Drawing in First Grade Children

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Research emphasizing children's cognitive development has grown considerably during the last twenty years. Specifically, two bodies of research have surfaced and flourished during this period--research dealing with children's drawings and research dealing with children's writings. Both of these literatures, although originating from separate disciplines, deal with similar constraints and problems. For instance, in both writing and drawing research a product is investigated, examined, or analyzed. Researchers investigate the drawing itself and infer about the process. Similarly, they infer process from written texts. In both cases, an internal cognitive process is inferred from a resultant product. Whether or not actual drawings or written texts are used, both types of research seek to posit theories of the composing process itself.

Many of these researchers have observed similarities across both modes of symbolic production. For example, Clay (1975) has stated the importance of drawing and scribbling as one of the first steps in the writing process--children learn that graphic symbols convey meaning. Similarly, in story dictation tasks where children were asked to make up an original story, with an experimenter present to serve as scribe, researchers' comments indicated children found the task easier if they drew prior to or simultaneously with their story production (Zalusky, 1982a). Goodnow (1977) discussed the influence of sequencing in handwriting conventions and its possible relationship to copying patterns in drawing. Goodnow (1978) also pointed out the similar modifications children made in drawings and in oral speech. She gave the example of a child who added an extended arm to a standard form drawing of a person to indicate that the person was "picking up" the ball. Such extensions are, she claims, similar to the way children change statements to questions: they simply add units to either end while leaving the center intact.

While similarities between writing, drawing, and oral language exist, particular properties which may be shared remain unaddressed. Several studies of symbolic processes may indirectly shed light on this matter (Ives, 1979; Ives, in press; Ives, Wolf, Fucigna, & Smith (1981; Olson, 1975). Yet, writing and drawing may possess similar attributes and share underlying cognitive processes.

To investigate these shared attributes between writing and drawing a series of studies was performed. This paper presents the statistical highlights of one study and discusses the texts of three children whose case studies comprised another study.

Method

The data from this study consisted of storybook journals collected from a class of 24 first grade boys and girls. Although data were collected from this class during the entire year, only data collected in September to early December were analyzed in the study. This particular classroom used an informal approach to literacy instruction and the teacher used children's literature, rather than basal readers, to teach reading. In keeping with this informal approach to teaching literacy, writing assignments tended to be negotiated between teacher and student rather than teacher-assigned. To make this task comparable with the children's regular writing activities, text length, time duration, and other similar aspects of production were not controlled.

Storybooks were analyzed using five rating schemes: (a) concept of message; (b) letter production; (c) cohesive harmony; (d) elaboration; and (e) placement. Tables 1 through 4 describe four of the rating schemes. (For a detailed description of cohesive harmony, see Zalusky, 1982b). Further, these data were analyzed using the multivariate technique of canonical correlation to investigate relationships between writing and drawing. For this analysis, concept of message, letter production, and cohesive harmony served as the writing factors, while elaboration and placement served as the drawing factors.

Results

The results of this study showed moderate to moderately high correlations for concept of message with letter production, cohesive harmony, elaboration, and placement; elaboration with letter production, cohesive harmony, and placement (see Table 5). In addition, the canonical analyses, presented in Table 6, revealed that the relationship between the two sets of variables was significant (χ^2 (6) = 18.80, $p < .0005$) and that about three-fourths (.7499) of the observed variance was accounted for by this relationship.

In Table 7, the composition of the corresponding canonical variates which have produced the significant canonical correlations is presented. The size of these coefficients is indicative of the relative contribution made by the original variables in the subset which formed the variates. In the first set, concept of message has the heaviest weight, although letter production also made a moderate contribution. In the second set, elaboration made a high contribution to the formation of the set, while placement made a low contribution.

Table 1
Concept of Message Scale

Rating	Description
1	Letter strings only; no letter-sound match ups.
2	Letter strings based on letter-sound relationships; work boundaries usually unclear.
3	Simple patterns, labels or clauses utilized in a repeated fashion; word boundaries observed; high frequency words are spelled correctly (e.g., I like my mother, I like my father, I like my dog).
4	Varied phrases and/or sentences--each phrase or sentence being different from the previous. Writing conventions usually include correct use of capitalization and punctuation. Correct use of punctuation is not of critical importance in this category however some use of punctuation generally occurs. Spelling in general is quite accurate.
5	Fluent writing - includes a wide range of writing as well as storybook conventions: punctuation, capitalization, chapter headings, numerical indicators for different chapter, use of "the end." As in category 4 spelling is generally quite accurate.

Table 2
Letter Production Scale

Rating	Description
1	All letters, upper and lower case, are the same size and may be located in any letter position. Simultaneous occurrences of a letter as upper and lower case may occur, but no size distinction is made.
2	Size determination for distinction of upper and lower case letters is discernable. However, there are very few occurrences of letters produced as upper and lower case within the same text. Upper and lower case letters may occur in any letter position.
3	As in the previous category, distinction is made between upper and lower case letters in size with letters occurring in any position within a word. However, there are frequent occurrences of upper and lower case for the same letter.
4	Size distinction is apparent. Upper case letters occur predominently at the beginnings of sentences or individual words.

Table 3
Elaboration Scale

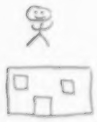
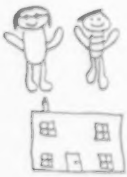
Rating	Example	Description
1		Human figures represented as stick-like figures with little facial detail or expression demonstrated. Buildings shown as simple structures with lines used to indicate doors and windows. Often the same pictures appear in isolation page after page with little variation.
2		Human figures have distinguishable body torsos. Evidence of hands, feet, and facial expression. The use of props, such as hats and glasses allow the viewer to begin to distinguish one human character from another. Decorated torsos indicate clothing however identifiable clothing pieces are hard to distinguish. Buildings are still shown as simple structures only now chimneys, window panes and door knobs are included.
3		Subjects appear in the context of a total picture with human figures evidencing hair, fingers, feet, shoes, eyelashes and eyebrows. Articles of clothing are differentiated. Sex and age differences are clear. Buildings show details such as window decorations, scenes inside the house, roof textures, or smoke emitting from chimneys. Comparison and contrastive drawings appear frequently in the category.
4		Subject matter is very detailed. Human figures are elaborately adorned with hats, head pieces, jewelry and different kinds of clothing. Extreme attention to detail is obvious. Buildings and structures are very detailed as evidenced by the boy who drew an aerial view of a football stadium including the different decks for seating, team locker rooms, team benches, flags and yard line markers.

Table 4
Placement Scale

Rating	Description
1	Drawing has no use of ground. Figures are scattered on page and appear to float.
2	The edges of the paper itself supply the ground for the figures. However figures tend to "hug" to the bottom corners of the page.
3	Complete and absolute symmetrical balance is achieved through placement of figures on the horizontal and vertical axes. In general, there is an indication of ground in the drawing.
4	As before, symmetry is achieved. But additional figures occurring on both sides of the vertical or horizontal axes are placed in unbalanced positions. This beginning use of asymmetry, according to Garfunkel, creates "tension" in drawing.

Table 5
Intercorrelations Among Writing and Drawing Factors of Concept of Message, Letter Production, Cohesive Harmony, Elaboration, and Placement

	Message	Letter	Cohesive Harmony	Elaboration	Placement
Message	1.000	0.506	0.359	0.622	0.493
Letter	0.506	1.000	0.151	0.614	0.282
Cohesive Harmony	0.359	0.151	1.000	0.336	0.025
Elaboration	0.622	0.614	0.336	1.000	0.344
Placement	0.493	0.282	0.025	0.344	1.000

Table 6
Summary of Canonical Analysis Between Writing and Drawing Factors

Root	Canonical R	Eigenvalue	Wilk's Lambda	Chi-Square	df	p
1	0.7499	0.5624	0.3906	18.80	6	.005
2	0.3276	0.1073	0.8927	2.27	2	.321

Table 7
Canonical Weights of Left and Right Set Variables Associated with the Significant Canonical Variates (Root #1)

Left Set		Right Set	
Original Variable	Canonical Weight	Original Variable	Canonical Weight
Message	0.6313	Elaboration	0.8531
Letter	0.4796	Placement	0.3052
Cohesive Harmony	0.0937		

The results of this first analysis obviously do not provide a basis for conclusive interpretations. However, the results do indicate that relationships exist between children's drawings and their written texts. Specifically, the correlations suggest that children who produce complete, varied, and original messages and who use capital letters primarily in sentence or word beginnings, also include greater detail in their drawings. These results indicate that writing and drawing may share a common cognitive base. For a more in-depth examination of these relationships, samples from three children's storybooks were selected for a case study analysis to highlight and illustrate these statistical findings.

Case Study Analysis

Michael. Throughout his storybook, Michael concentrated on Halloween creatures or symbols--pumpkins or creatures and symbols from outer space. Among the Halloween subject matter Michael chose were pumpkins, devils, ghosts, monsters, mummies, and Count Dracula. Included in his parade of scary ghosts and goblins were Martians and spaceships. Michael often introduced his characters with a "This is..." phrase (see Figure 1). Then, in other efforts, he offered

Figure 1. "This is the devil."

Figure 2. "Mummies are scarey."

Figure 3. "Devils live underground."

his reader added information about these characters. Notice, in Figure 2, his comment that "mumesrskarre" (mummies are scary).

Michael's writing is beginning to reveal qualities of descriptive writing (see Figure 3). In addition, his drawing supplements these emerging qualities in writing by providing supporting details through drawing.

Even though his drawings of both the devil and the mummy are isolated from the context of a whole picture, the lines underneath the mummy show an attempt at a ground-sky relationship. Notice also that he has chosen to give the devil horns and a pitchfork--a beginning of elaboration. The mummy is a creative use of a stick figure variation. Michael has placed the lines both horizontally and on a slant to achieve the wrapped effect of a mummy. This is an apt attempt on Michael's part to distinguish these monsters within his mode of presentation.

Clearly Michael has achieved a sense of letter-sound relationships in his writing, even though word boundaries are not observed. It seems fairly obvious that Figure 2 was an earlier effort than Figure 1. However this is not the case. In Figure 1 Michael experiments with word boundaries by using lines. This strategy allows him to create the illusion of correct word boundaries. Notice the similarity with his spacing of "This is" and "Mumesrskarre." These two figures demonstrate an emerging awareness of the spacing conventions in writing.

Linda. Linda's storybook was very interesting because, in several cases, she offered information and then extended and elaborated on that initial effort through both drawing and writing. Figures 4, 5, and 6 came in immediate succession in her book. She combined the "This is..." and the "I like..." pattern to achieve an elaborative effect. Notice in Figure 4 she introduced the subject--a flower. In Figure 5, she has both told us and shown us that she likes flowers by writing it and putting herself in the context of the picture near the flowers. Then, in Figure 6, she elaborated on the aesthetic qualities of the flowers by portraying them against a blue sky, perhaps so that the reader might also enjoy them.

In these three drawings, Linda has demonstrated that not only does she have a clear understanding of sound-symbol relationships and word boundaries, but she has an understanding of simple and extended sentences. In addition, Figures 7, 8, and 9 show that Linda has begun to use contrastive features in her writing. These three figures illustrate how drawing and text can work together to create a desired effect. Imagine, for instance, how different Linda's message might have been had the drawings not accompanied her text.

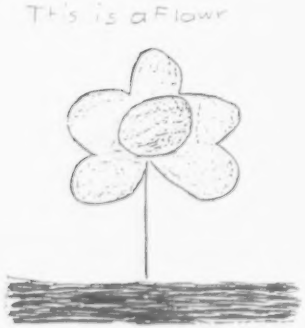


Figure 4. "This is a flower."

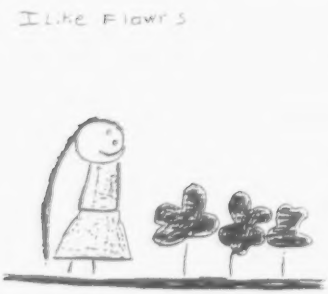


Figure 5. "I like flowers."

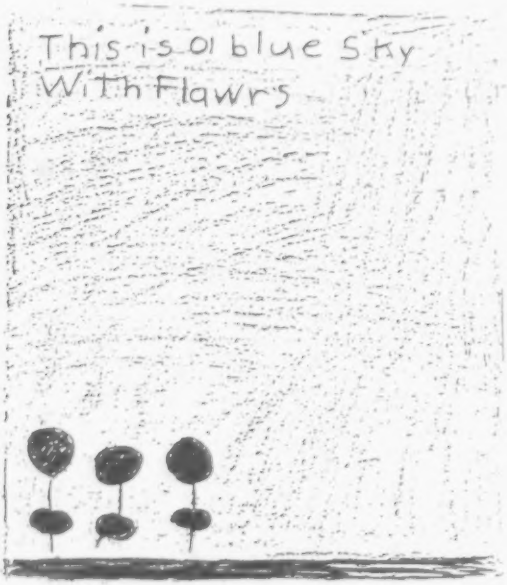


Figure 6. "This is a blue sky with flowers."

Figure 7. "This is a house."

Figure 8. "This is a house with my mom."

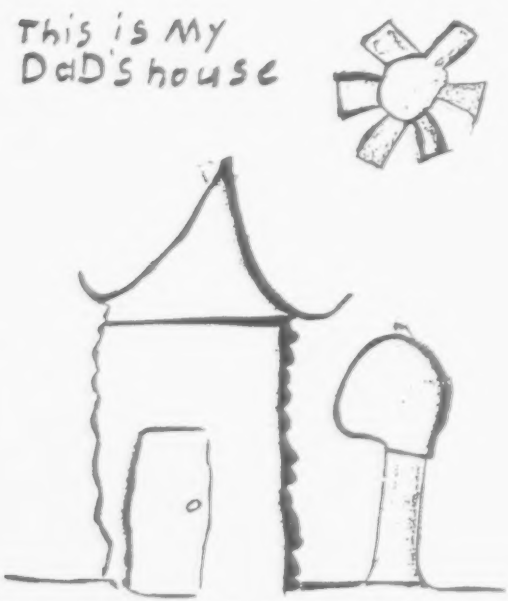


Figure 9. "This is my dad's house."

Barbie. In the context of Barbie's storybook, she has a brief story about Miss Martian. Figure 10 is a portrait of Miss Martian with the jagged lines representing the electric shock waves that vibrate through her body to keep her safe. Notice how Barbie has utilized disproportioned human features--four eyes, four arms, wide mouth--to make her Miss Martial distinctively "Martian." Her text shows use of original text composed of complete sentences. Barbie introduces her character, like Michael and Linda, with a "This is..." phrase. However, her labeling of Miss Martian is also similar to that of a caption in an illustrated text, whereas, Michael's and Linda'a are more similar to the format of a picture book. Her obvious use of elaboration in the drawing--Miss Martian's crown, earrings, necklace, and hairdo--is illustrative of a child that would receive a high rating on elaboration. Later adventure of Miss Martian (Figures 11 and 12) give the reader a detailed view of her planet, complete with several kinds of antennae protruding around the planet and a sign indicating the location of her house, as well as a sampling of her school work with her name and an indication of the subject matter. Barbie's text reveals beginning story elements. She has introduced the character and setting of her story using descriptive and narrative qualities of writing. With Barbie, as with Michael and Linda, the production is effective as a form of communication. All three subjects are convincing authors both in their use of written language and in the aesthetic language of drawing.

Figure 10. "This is Miss Martian."

Figure 11. "This is her planet."

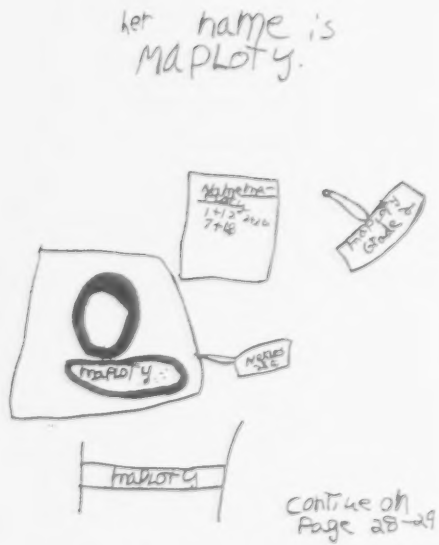


Figure 12. "Her name is Maploty."

Conclusion

The significant findings of this study have implications for future research. More and detailed analyses need to be conducted on different modes of children's production. Just as Clay (1975) has observed links between early writing skills and those skills required in the acquisition of reading, so may writing and drawing be related. Research on the associations between writing and drawing will ultimately shed light on relationships between drawing and general literacy factors as well as the underlying cognitive structures which are employed in the general use of language: oral, written and aesthetic, and their resulting powers of communication.

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Constructing Musical Knowledge

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This study investigates musical thinking and creative processes as they relate to problem solving and learning. It examines the process of constructing musical knowledge and how this develops with age, paying attention to changes in representation and the identification of problems.

Generally speaking, music education relies on traditional music theory as a framework for understanding music. But this may not be the only path to musical understanding. A logical framework based on expert knowledge can seem arbitrary and does not necessarily make sense to everyone, especially if one does not have the necessary conceptual foundations. Many wrongly conclude that they are not musical, even when they enjoy music a great deal. Then there are others with musical training who demonstrate superficial success without ever really grasping the fundamentals of music. This points to the need for developing other models for learning about music.

Studies that look at how the human processing system handles musical information may provide music theory with a broader framework for addressing musical issues and for relating to musical activity in general. We are learning more about the grouping of pitch and duration, pitch centering, memory, and the role of intervals in dealing with pitch which may also help us understand the evolution of our music systems (Deutsch, 1982). But much of the work in music perception and cognition involves a passive listener making choices from a limited collection of possibilities. This stimulus-response model is an artificial musical environment designed to examine only specific aspects of how we deal with music. It does not look at real-world musical activity.

Efforts to address music as a whole have come from music theorists and composers concerned with trying to better understand what they hear and do. They provide insight into expert handling of music in an attempt to capture how we make sense of and understand music (Cooper & Meyer, 1960; Lerdahl & Jackendoff, 1983). However, these approaches assume an educated listener experienced in a musical style and do not address how one comes to this understanding of music.

Work in cognitive development and the development of intelligence can provide broader insight into how one makes sense of the world. In a Piagetian model, cognitive abilities evolve through constructing successive conceptual models of the world that one interprets and operates on. Music, like language or visual images in the environment, can be viewed as material for constructing

knowledge by children and adults. Examining people actively constructing their own musical knowledge is providing new insights and suggests different approaches to musical learning (Bamberger, 1974).

Method

Materials

Two music-rich environments were established for this study. Both provided musical objects that could be manipulated and controlled by subjects in intuitive and meaningful ways without dictating specific approaches or solutions. The first used a set of separate bells that were identical except for the pitch produced when struck with a mallet. The second used the programming language LOGO to play music at the computer. Neither environment required that one know how to play an instrument or read music. The bells were separate, tangible objects that could be manipulated and were free of any notational clues (size, shape, color, labels, etc.). The computer required the creation of melodic fragments called "tuneblocks" using numbers to represent pitch and duration. Subjects played the tuneblocks by typing the tuneblock names in any order, any number of times and pressing the RETURN key. Both environments encouraged inventing representations based on one's own understanding and thinking.

Subjects

Subjects for this study attend a predominantly Black and Hispanic urban K-8 public school. All students grades 1-8 participate in a music class for one 40 minute period each week. Two interested students from each of two 1-8 grade classes were selected at random for this study. One group from grades 1-8 worked with the bells, the other group from grades 1-8 worked with the computer for 5 sessions in place of their normal music class. Students worked in the school's computer lab 1-2 periods a week, and most classes in grades 4-8 had been introduced to LOGO at some point in the year.

Data

Detailed protocols of all sessions were kept including audio recordings of work with the bells, logs of what was typed at the computer, and copies of tuneblocks and tunes created.

Results

Bells

Arranging bells from low to high. Almost every subject initially described the difference between bells as one of loudness. After focusing on the differences between the same bell struck differently and different bells struck the same way, most subjects could then identify which of two bells sounded higher. Arranging three bells from low to high did not occur before the fourth grade on. By the sixth grade, all could do this.

Arranging all eight bells from low to high was much more difficult. First graders could not put the bells into any order at all. They played and repositioned bells without establishing an ordering. Some subjects arbitrarily lined the bells up from left to right, then played them. The other subjects began by picking either the lowest or the highest (or both) of the set as their starting bell. Playing through the remaining bells, they chose what they thought was the lowest or highest bell and placed it next in line. They did not compare it with all of the remaining bells to make sure it was the lowest bell left. Subjects rarely played through the bells they were ordering to confirm that those in place indeed went from low to high. Although the bells had not been arranged from low to high, subjects were satisfied with their final ordering. Only one second grader who checked to make sure each next new bell was also higher than the ones already ordered was successful.

All subjects said a second set of bells played from low to high (C major scale) sounded familiar and went from low to high. Those who applied their previous strategy to ordering the bells were again unsuccessful. Third and sixth graders compared each bell of the model set, in order, with all of the bells in their unordered collection to find a match. With each next match, they made sure the tunes each set played sounded the same. Only the second grader who had already arranged the bells from low to high and the seventh graders worked without comparing what they did to the model set of bells. After choosing the lowest bell, they looked for the next bell in their remaining collection. They played through their ordered set before striking each of the remaining bells to find the next one. When they heard the right next bell they added it onto the end, played through their ordered set to check the tune so far, then searched for the next bell in the same way.

Playing "Twinkle Twinkle Little Star." Except for the second grader who could arrange the bells from low to high, subjects could not play "Twinkle" on the bells before the fifth grade. These students would hit the bells in rhythm as they said or sang the tune. It wasn't until the fourth grade that they attempted to arrange the

bells in the order they occur in the tune. Fifth-eighth grade subjects first found or were given the lowest bell to begin the tune with. They then looked for the next bell of the tune in their remaining collection. They played through the bells they had arranged in the order they were to be played. Then, they looked for the next bell among the remaining bells. They had no problem playing the same bell twice for each two syllable word ("Twin-kle twin-kle little..."). Only the seventh graders used their second bell again for the fourth word, "star." The other subjects needed another G bell for "star." The fifth graders who arranged their bells in two adjacent rows of three were the only ones who went back to the first bell for the end of the first part (...are"). Those who arranged the six bells one after the other needed another C bell. All of these subjects would then figure out how to play the tune with the duplicate bells removed. Where time permitted, these subjects could also play the tune on the bells arranged from low to high.

Tunes using C-D-E-F and G-A-B-C. To create their own tunes subjects placed the bells next to each other in a row or formed a square of four bells without first playing the bells. Once in place, the bells were rarely rearranged except for someone else to use.

For first-third graders, making a tune meant playing each bell once across or around the bells, applying the same rhythm for each bell, then repeating the pattern. They often sang songs they knew as they played. Notations ranged from none for first graders, to the second graders' description of the session ("We made songs."), to the name of the song to perform on the bells for the third graders.

For older subjects a tune was more than repeating a pattern to take up time. A phrase or gesture was tied to its path across all four bells and the structure of tunes evolved from the path taken. The outline of their tune involved getting from one end of the bells to the other (or around), and either staying there or returning along the path to the start. If one bell was left out, another phrase was required for its return. Variation of path had the effect of reordering the bells in each phrase which repeated rhythmic patterns. Different rhythms for phrases helped set them off structurally from each other.

The use of left or right end bells as beginnings/ends to tunes helped to establish them as the pitch focus. In the collection C-E-F-G the lowest bell C was usually established as the focus. For the collection G-A-B-C, the highest bell C was the preferred pitch focus.

Notations for tunes were most often instructions explaining the order and how many times to strike each bell (...hit the third bell two times...). There were a few drawings of the four bells, with numbers indicating the striking order and slashes or numbers

for the hits to make. Others showed the actual path to take across the bells with how many hits for each bell. Recognizing that the tune would sound different with another arrangement or collection of the bells, a few notations tried to describe the relationship between the bells required for the tune. No one tried to indicate the relative duration of events.

Creating tunes using C#-C#-F#-G#-A# (pentatonic scale). Subjects commented that they liked the sound of these bells and that almost everything they played sounded good. First and second graders created tunes they liked and could play over again. Their tunes were in two rhythmically rhyming parts, elaborating a path across the bells and sometimes back again. First graders made no notation of their tune. Second graders again described their activity ("Play the tune on the bells"). The third graders performed pieces they knew on the bells, explaining that music was someone performing in a concert. Their notation was the name of the pieces they performed.

Fourth-eighth grade subjects developed more elaborate paths going to or returning to an end bell. Rhythmic variation added interest to repeated paths. Omitting one of the bells in a path or using path variation was used to develop longer tunes with more complex structural relationships. While end bells and C# (lowest bell) were preferred, a middle bell could also be established as a focus. Most notations indicated the order and how many hits on each bell. A few subjects used pictures of the bells with numbers for the order and number of hits required. There was no increase in detail from the last session and no indication of duration.

Creating tunes with Eb-F-G#-A (m2-A4 intervals). Working with a less familiar collection of bells all subjects continued to develop tune building ideas and strategies. First-third grade subjects again did not notate their tunes. All phrases of their tunes sounded each bell at least once, repeating the same rhythmic pattern each time. Their tunes made use of varying the paths across the bells which created a larger structure and a stronger sense of direction and consequence.

Fourth through eighth graders developed more elaborate path, pitch, and rhythmic variation, creating longer tunes that sounded more complete and whole. Paths going to and returning to were more elaborate in bell and rhythm combinations. The interplay between primary and secondary goals of the path made the two-part tunes sound more anticedent-consequent. Path elaboration and returning to previously skipped bells were used to develop three and four part tunes. Rhythmic variation and diversity helped to distinguish structural parts, contributing to a sense of beginning-middle-end in tunes. End position was less important in establishing pitch focus as tunes generated their focal pitch away from end bells. While A was the most common pitch focus, F and Eb were also established by

tunes. In developing larger structures, all tunes involved a competition between the focus bell as a final goal and an alternative bell. While more detailed, most notations were again instructions for which bell to strike and how many times. Structural grouping was indicated by a 'pause' (7th grade) and brackets were used (8th grade) to show where hits should be longer to group them together.

Computer

Reconstructing familiar tunes. All subjects could identify "Row," "Twinkle," and "Baby." First graders could not reconstruct a song using its tuneblocks. Second graders associated tuneblocks with the words of the tune. They worked by trial and error until only one change was needed to get "Row," and trial and error to get them close enough to "Twinkle" to recreate it. Although second graders could describe aspects of the structure of "Twinkle," this did not help them recreate the tune.

Third graders could identify the tuneblocks and make localized changes as they worked by trial and error. After getting what they thought was the first part of "Twinkle," they used three more tuneblocks to create a version of the tune that reversed the second and third tuneblocks. These have the same rhythm and melodic shape but S2 is one scale degree above S1 (their S3-S4 S2-S1 S6-S5 is the same as S3- S2 S3-S1 instead of S3-S2 S1-S2 S3-S1).

Fourth grade subjects used the words of the tune as handles to more consciously move the tuneblocks around. While successful with "Row," they counted that "Twinkle" needed six tuneblocks and noted that "it repeats." Instead of the opening returning at the end to create three parts, their model produced a "Twinkle" that was in two parts: S2 S3-S1 S2 S3-S1 instead of S3-S1 S2-S2 S3-S1.

By the fifth grade, subjects could use the words of the tune to control and manipulate each tuneblock and construct the desired tunes. Even though, except for the sixth graders, they recognized that some of the tuneblocks sounded the same, they needed six different tuneblocks when three was enough.

When allowed only three tuneblocks, they constructed the tune by matching the required tuneblocks with the extra tuneblocks, or by starting over and listening for which tuneblock should be next. Like the third and fourth graders, some subjects followed a model that repeats the first part (S3-S1-S2 S3-S1-S2) rather than having it return (S3-S1 S2-S2 S3-S1). Or, they switched S2 and S1, perhaps because the words are different (S3-S2 S1-S1 S3- S2). Even though the first and third tuneblocks of "Baby" are the same (B3 -B2 B3 -B1), subjects needed another tuneblock (B3-B2 B6- -B1) before they could play the tune using only three tuneblocks.

Familiar tuneblocks within unfamiliar tunes. Searching for a tune within the collection, first-third grade subjects tried random combinations and repeated patterns of tuneblocks to use up time. They could not point to the tuneblocks as they were played. Everything they tried sounded equally good to them and they did not make a tune. Hearing the model tune made up of the same tuneblocks they had worked with, they could not reconstruct the model even when given the opening tuneblock.

Starting by trial and error, fourth-eighth graders would focus on something that sounded coherent to them. They would then add onto or expand this framework to create a tune. With age, subjects could better articulate what they liked and disliked and why tuneblocks went together. They made decisions more and more on the basis of melodic connection, rhythmic flow and proportion. They became concerned with functional beginnings, middles, and ends. These subjects could point to the tuneblocks as the computer played them. They could reconstruct the model tune, recognizing each of the three tuneblocks of the first tune as they were played. The longer second tune was more difficult. They compared their reconstruction with the model as they searched for and then added each next tuneblock.

Playing and teaching the computer tuneblocks. First-third graders used numbers at random and counting up and down for pitch and duration. They did not relate the numbers they used with the notes produced. Instead, they worked in a more general way, taking up time by playing many notes together or using very large numbers for durations. Third graders began to connect the increase or decrease of numbers with the general rise or fall, or getting faster or slower concerning what they heard.

Fourth-eighth grade is marked by increasing concern for control of melodic contour, register and rhythmic movement, and for establishing functional beginnings and endings to tuneblocks. Numbers were first handled in a general way, using smaller or larger numbers to go faster or slower, or higher or lower. Arbitrary number sets, like phone numbers, were also used to generate possibilities. As subjects related the numbers they used for pitch and duration to what they heard, they could create tuneblocks with general shapes in mind. Then, they would change the numbers for pitch and duration to clarify the beginning or end, making it higher or lower, or longer or shorter, and to better define the tuneblock as a whole. Older subjects tried keeping duration constant in order to focus on pitch and used increments of 10 to make changes in pitch and duration more pronounced. They wanted their tuneblocks to "sound like something" and played them together to get a sense of the whole they were creating. None of the collections of tuneblocks established a tonal framework or used rhythmic patterns or subdivision of beats to control time.

Creating a tune with tuneblocks from Sessions 3 & 4. First and second graders played their tuneblocks in random orders, usually using each tuneblock once, to find a tune. There was no controlled manipulation or revision except when two tuneblocks were each repeated a number of times to make a tune. Their tunes were combinations they had played and liked. These generally had more melodic connection than those rejected and were often in two parts.

Third and fourth graders also used each tuneblock once, but their tunes were more the result of constraints which eliminated some of the tuneblocks or provided a framework to work in. Alphabetical order or using tuneblocks with only girls' names resulted in melodic connection within each tune's two registrally separated parts. A more musical restriction required the tuneblocks go from short to long. This resulted in more rhythmic connection and an overall melodic contour. One tune, rather than connect tuneblocks, kept them distinguished from each other. Another tune repeated two tuneblocks a number of times to clearly articulate a structure.

Fifth graders could recognize and extract combinations of tuneblocks from what they played for further development. They were concerned with controlling the contour and flow of what they heard and with having a convincing beginning and end. They rejected tuneblocks that did not fit and created new tuneblocks to meet their evolving needs.

Sixth graders also created new tuneblocks but for more clearly defined reasons. Working back and forth across the entire tune, they altered pitch and duration to make tuneblocks fit together better, replaced tuneblocks that sounded wrong, and created tuneblocks they needed. They structured two larger tuneblocks that were then combined to create their final piece.

Seventh graders gradually eliminated all of their tuneblocks that did not sound right to them. This left only one familiar sounding tuneblock to work with. Their tune was formed by different repetitions of this tuneblock followed by a sustained pitch as a goal. This gave them a clear, regular structure and the impression of the beginning of a familiar sounding piece.

Eighth graders linked some of their tuneblocks together to create larger tuneblocks that established a context to work in. To continue their tune, they created tuneblocks consistent with the stylistic framework that had been established.

Discussion

For first-third graders, music meant making sound to take up time. Music was more than parts to control or manipulate, it was an activity and sensory experience that could not be broken apart. On

the bells it was not important what they played, but that they were immediately involved in producing music. With the computer, playing a collection of tuneblocks in any order was a piece. They sang or danced to have something to do, otherwise they were uninvolved listeners. When their music was done, it was gone. They had little to say about it except describe the general activity that would produce another equally good piece ("Play a tune on the bells," "use the tuneblocks").

Fourth grade marked a change in the subjects' relationship to the music they made. They could reconstruct tunes with tuneblocks and used some form of notation to describe their pieces using the bells. While they experienced the music event to event, they could identify and grab ahold of the parts they heard. With age, subjects developed more conscious control over their musical activities. They moved from dealing with events in the order of occurrence to being able to step outside of their work and make decisions concerning function and structure in terms of the whole tune. Where younger subjects were directed by the process of making music, older students became increasingly aware of the musical product.

There was very little use of traditional music terminology and almost no concern for measuring and comparing pitch or duration. Does this mean that even in the 7th and 8th grades these issues are not or cannot be understood? In a curriculum devoted to time on task, these subjects are not accustomed to working or thinking for themselves and are often disengaged from learning. Reflecting this intellectual climate, the musical training students received seems to have had little impact on their development of skills and musical insight. Beyond their weekly music class, none of the subjects in this study have had any significant formal musical involvement with instrumental or vocal lessons or performance. What this study then provides is a framework of starting points for musical thinking. Further study, allowing subjects more time actively involved with the musical objects to continue to develop and explore their own theories of music, might present a picture of the evolution of musical understanding at different ages. Repeating this study using subjects with more formal musical training and who already demonstrate a degree of musical proficiency would present yet another, perhaps complementary picture to fill out this framework on the development of musical thinking.

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The Effect of Sustained and Non-sustained Sounds on Adults' Representations of Simple Rhythms

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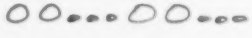
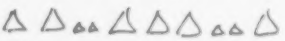
How do people experience rhythm in music? How do they form written representations of what they hear? How close a match is there between standard music notation and the systems that people of different musical backgrounds spontaneously invent?

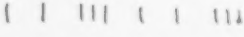
Although most adults can clap simple rhythms with accuracy and ease, their written representations of these patterns differ in interesting ways (Bamberger, 1975, 1980, 1981; Hildebrandt & Bamberger, 1980). People who read music regularly from a score tend to use "formal" systems of representation. In contrast, people who do not know how to read music tend to produce "figural" and "spatial analogue" representations. Figural and spatial analogue representations are also produced by people who once knew how to read music, but who do not read it any more.

Examples of these three systems of representation are presented below. Each drawing represents the rhythm pattern that underlies the words "three, four, shut the door; five, six, pick up sticks."

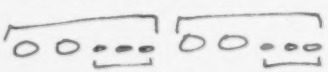
Figural notation: 

Formal notation: 

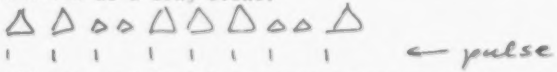
Spatial analogue:

Standard notation: 

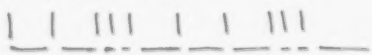
Figural systems of notation focus on rhythmic groups or "figures." In contrast, formal representations focus on the relative durations between the onset of each event. The difference between the figural and formal representations shown above can be seen most clearly in the representation of the fifth and tenth events. In the figural drawing, the fifth and tenth events are represented by small symbols. This is by virtue of their membership in a group of events that "go together" and "get faster." The three fast events are followed by a pause that is understood but not represented. The pause creates a boundary between two larger rhythmic groups which form a repeated figure.



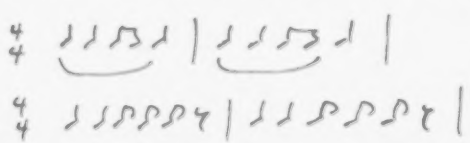
In formal drawings, the fifth and tenth events are represented by large symbols. This is due to their membership in a class of events that share the same duration. It comes as a surprise to many people to find that the fifth event is actually the same duration as the first and second. In order to test this assertion, one need only to generate a steady, underlying pulse at the rate of one per large symbol and then play the surface rhythm with it. When this is done, the relative durations of these events becomes apparent. While formal drawings provide good representations of the durations between the onset of each event, they often obscure the rhythmic groupings that figural drawings represent so well. This is particularly apparent in this rhythm pattern, where a short event followed by a pause is represented as a long event.



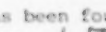
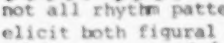
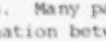
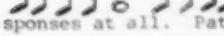
Unlike figural and formal representations, spatial analogues use space to represent time. These drawings are particularly interesting in that they can reflect both rhythmic groupings and durations. For example, if one focuses on the vertical lines in the example below, the following pattern emerges: "long, long, short, short, short; long, long, short, short, short." However, if one focuses on the space between the lines, a different pattern emerges: "long, long, short, short, long; long, long, short, short, long." A focus on the vertical lines produces a figural representation of the pattern, while a focus on the spaces between the lines produces a formal representation of the pattern. Herein is where the ambiguity of spatial analogues lies.



Standard music notation is primarily a formal (metric) system of notation. However, it is possible to represent rhythmic figures in standard music notation with the use of slurs and in some cases, rests:



In the top example, the notes represent the durations between the onset of each event and the slurs mark the boundaries between the two rhythmic groups. In the bottom example, the notes represent the durations between the onset of each event and the rests provide a measure of the pause that people who use figural notation hear between the two rhythmic groups.

The figural/formal distinction has been found in the pattern and also in the pattern  . However, not all rhythm patterns are constructed in such a way that they will elicit both figural and formal responses. Many patterns, such as make no discrimination between adult responses at all. Patterns which seem most likely to elicit both types of representations are those which are ambiguous. The ambiguity of these patterns lies in the inclusion of a particular configuration of durations. These durations are in a 2:1 ratio to each other, and occur in the order "short, short, long, long" (SSLL). The pattern  contains this ambiguous kernel. Other patterns that contain this kernel are  and  .

Figural and formal modes of representation have been studied in both children and adults (Bamberger, 1975, 1980, 1981; Hildebrandt & Richards, 1978; Buder, 1980; Hildebrandt, 1984). However, the scope and limitations of this distinction have not been fully explored. Since research on this topic has been done using a small number of patterns played with non-sustained sounds (claps or clicks), one frequently raised question is, "Will musically untrained subjects continue to make figural representations of rhythm patterns even when sustained tones are used?" Intuitively, one might expect this not to be the case, since sustained tones might make the durations between the events more salient. However, if untrained subjects actually do focus on groupings rather than durations, the use of sustained tones should not effect their underlying system of representation.

The purpose of the present study was (a) to determine whether the use of sustained tones would make any difference in adult's written representations of simple rhythms and (b) to test whether the figural/formal distinction would hold up across a wider variety of rhythm patterns than had been previously used. It was expected that the use of sustained tones would not effect subjects' representations of simple rhythms. It was also expected that each SSLL pattern used in the study would generate figural, formal and spatial analogue representations.

Method

Subjects

Two groups of subjects participated in the study: 16 "trained" adults who read music regularly from a score, and 16 "untrained" adults who did not know how to read music, or who once knew how but do not read it regularly any more. All were undergraduate students at the University of California at Berkeley.

Stimuli

Two audio tapes were made of a series of four SSLL rhythm patterns. Each pattern was played four times--twice with clicks and twice with sustained tones. Each tape consisted of the same series of 16 items presented in a counterbalanced order. The rhythm patterns used in the study are presented in Figure 1. In addition to the tapes, two sets of written representations were prepared. For each rhythm pattern, a choice of three representations was given--one figural, one formal, and one mixed representation that employed aspects of figural and spatial analogue representations. Examples of the written representations presented for rhythm #1 appear in Figure 2.

Procedure

The untrained subjects were interviewed individually and the trained subjects were interviewed individually or in small groups. First, each subject was asked to listen to a rhythm pattern and then to clap or sing it back. Then he or she was asked: "Put something down on paper that would help you to remember the pattern or help someone else play it like you did." Half of the subjects listened to Tape 1 and half listened to Tape 2.

After making a graphic representation of each pattern, the subjects were asked to clap or sing the patterns back and to explain how their system worked. Next, they were shown the written representations described above. The same series of four patterns was played again with clicks and tones and the subject was asked to indicate which drawing would be the best representation of the rhythm.

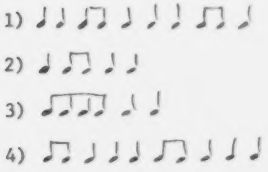


Figure 1. Rhythm patterns used in the study.
Note. All of the patterns were played at =MM 80 with no added accent or stress. The click was the sound of a pen hitting a desk. The tone was a sound produced by an electric organ at D above middle C.

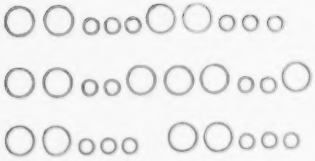


Figure 2. Examples of figural, formal and mixed representations of the pattern

Results

While the majority of trained subjects used standard music notation, the untrained subjects invented a wide and colorful variety of symbols to represent the rhythm patterns. Examples of their drawings are shown in Figure 3. These drawings were coded according to the underlying system of representation that was used. Each pattern generated figural, formal, and spatial analogue representations. Interrater reliability was assessed for just over half of the data. The percentage agreement between two coders was °4%.

The mean number of figural, formal, and spatial analogue representations made by trained and untrained subjects for the first eight patterns is presented in Table 1. Trained subjects produced mostly formal drawings and untrained subjects produced mostly figural and spatial analogue drawings. Ninety-eight percent of the drawings made by trained subjects were formal and 93% of the drawings made by untrained subjects were figural or spatial analogues.

A pattern by pattern analysis was done of the first eight rhythms in order to evaluate consistencies and inconsistencies in subjects' use of figural, formal, and spatial analogue representations for patterns played with clicks and sustained tones. For each rhythm pattern, the Karl Pearson Test of binomial proportions was used to contrast the number of people who used the same system of representation with the number of people who used a different system of representation. The results of this analysis are presented in Table 2. In each case a significantly greater number of people used the same system of representation for patterns played with clicks and sustained tones. The majority of subjects who used a different system of representation were in the untrained group.

In order to assess the stability of subjects' representations across time, an additional pattern by pattern analysis was done using

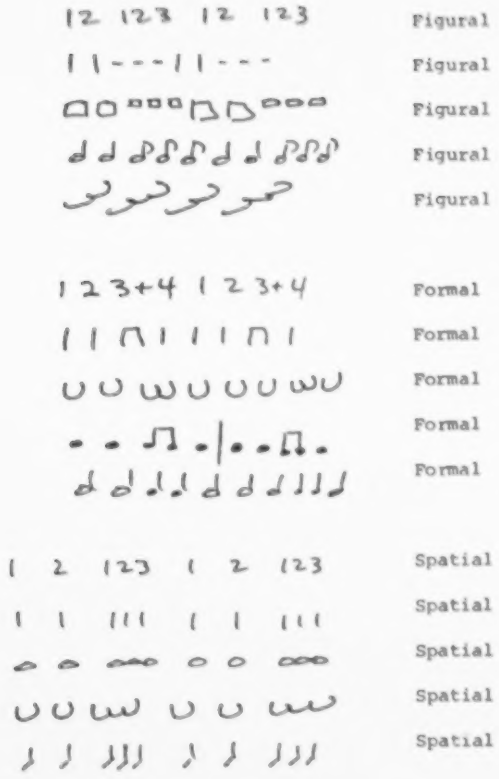


Figure 3. Examples of systems of representation used by trained and untrained subjects to represent the rhythm pattern

Table 1
Mean Number of Figural, Formal, and Spatial Analogue Representations Made

Subjects	Clicks			
	Figural	Formal	Spatial	Other
Trained	0.06	3.88	0.06	-
Untrained	1.69	0.25	1.87	.19

	Tones			
	Figural	Formal	Spatial	Other
Trained	-	4.0	-	-
Untrained	1.38	0.31	1.56	0.75

N = 16 per group with 4 possible per cell.

all sixteen rhythms. Subjects' representations of identical patterns were compared (clicks vs. clicks; tones vs. tones). The results of this analysis are presented in Table 2. Again, a significantly greater number of subjects used the same system of representation for exact repetitions of the rhythm patterns. The majority of subjects who used a different system of representation were again in the untrained group. Surprisingly, variability of response to identical patterns was equal to or greater than variability between patterns played with clicks and sustained tones. This suggests that many of the untrained subjects' systems of representation were still in a process of evolution.

Regarding the drawings that subjects chose as the best representations of these patterns, there were again marked differences between the trained and untrained groups. Table 3 shows the mean number of figural, formal, and mixed drawings chosen by trained and untrained subjects for patterns using clicks and sustained tones. Trained subjects tended to choose formal representations of these patterns and untrained subjects tended to choose figural representations. Of particular interest are the choices made by people who used spatial analogues to represent these patterns. In this task, people who used spatial analogues preferred figural representations over formal or mixed representations. Fifty-four percent of their choices were figural, 28% were mixed, and 16% were formal. This suggests that their interpretation of their own spatial analogues is primarily figural or mixed.

Conclusion

The purpose of the study was to determine whether the use of sustained and non-sustained sounds would make any difference in adults' written representations of simple rhythms, and to test whether the figural/formal distinction would hold up across a wider variety of rhythm patterns. Each SSLL pattern used in the study yielded figural, formal, and spatial analogue representations from trained and untrained adults. Trained subjects produced mostly formal representations. Untrained subjects produced mostly figural and spatial analogue representations. There was no significant difference between the systems of representation used for patterns played with clicks and sustained tones. Similarly, trained subjects chose mostly formal drawings to represent the rhythms while untrained subjects chose mostly figural representations.

These findings demonstrate that psychological research in music can help teachers better understand the individual needs of their students. The distinction between figural and formal systems of representation is theoretically powerful, not only because it explains why some people might initially have trouble learning to read music, but also because it shows that a great number of seemingly random errors in sight reading and dictation might not be so

Table 2
Number of Subjects Using Same and Different Systems of Representation for Patterns Played with Clicks and Sustained Tones (N = 32)

	Representation of Patterns		
	Same	Different	X^2 df (1)
Rhythm #1	27	5	15.13**
Rhythm #2	28	4	18.00**
Rhythm #3	28	4	18.00**
Rhythm #4	28	4	18.00**

Number of Subjects Using Same and Different Systems of Representation for Identical Patterns Played with Clicks (N = 31)

	Representation of Patterns		
	Same	Different	X^2 df (1)
Rhythm #1	21	10	3.90*
Rhythm #2	24	7	9.32**
Rhythm #3	28	3	20.16**
Rhythm #4	26	5	14.23**

Number of Subjects Using Same and Different Systems of Representation for Identical Patterns Played with Tones (N = 31)

	Representation of Patterns		
	Same	Different	X^2 df (1)
Rhythm #1	27	4	17.06**
Rhythm #2	25	6	11.65**
Rhythm #3	27	4	17.06**
Rhythm #4	27	4	17.06**

* = $p < .05$; ** = $p < .01$

Table 3
Mean Number of Figural, Formal, and Mixed Representations for Patterns Played with Clicks and Sustained Tones

Subjects	Clicks		
	Figural	Formal	Mixed
Trained	0.37	3.50	0.13
Untrained	2.81	0.37	0.81
	Tones		
	Figural	Formal	Mixed
Trained	0.69	2.93	0.38
Untrained	2.44	0.25	1.31

N = 16 per group with 4 possible per cell.

random after all. Figural systems for representing rhythm patterns, while not immediately transparent to those who read standard music notation, are nevertheless systematic, understandable, and possibly quite basic to the way people spontaneously understand and structure their musical world.

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Observing Children's Metacognitive Structures Through Music-Rhythm Processing

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In the world of music, time, and space--hearing and seeing--are important factors. The auditory patterns we hear performed in the time domain as a sequence of sounds are notated visually in the space domain. Likewise, the process humans engage in called "reading" involves transforming a sound sequence (oral language) into a visual form (print) and vice versa. One must integrate the sounds in the time domain with the visual, graphic encoding, the ordered sequence in the space domain. This transformation between auditory and visual modes presents a difficult task for individuals to master and is more difficult for some than others (as in language reading and music reading disabilities). Although such integration and ordering of information obtained through sensory channels has been studied via auditory-visual integration tasks in a variety of ways, few, if any, have observed the underlying metacognition involved in carrying out such a task. It is here that music provides a unique window to view the processes and mechanisms operating in this integration task. Comparing children of differing reading ability and developmental levels in their reproduction of rhythm samples, manipulation, and coding of the rhythmic events into a visual representation, and documenting their processes allows observation of the underlying metacognition involved.

Significant and high correlations between reading disabilities and performance on integration tasks have been reported. These previous studies have looked at correlations with IQ, sex, and separate modalities such as visual to visual, and auditory to auditory (Blank, Weider, & Bridger, 1968; Blank & Bridger, 1966, 1967; Kahn & Birch, 1968; Sterritt & Rudnick, 1966; VandeVoort, Senf, & Benton, 1972). The suggested explanations for this correlation have been verbal mediation (Blank & Bridger, 1966, 1967; Blank, et al., 1968), memory and attention (Ross, 1976; VandeVoort, et al., 1972), along with the categorization of conceptual tempo--impulsive versus reflective styles (Margolis, 1976). In spite of experimental design problems among these studies (added visual input, low ceilings for tasks, nature and length of task demanded) a consistent picture of a positive relationship between this integrative task and the reader's ability remains, without the actual functioning of this relationship elucidated.

Although this integrative task--going from a sound stream to a visual representation--appears to be primarily and directly perceptual in nature, it can be argued that this task requires at the same time a high level of abstract conceptualization in order

to be successful. Thus, failure in the crossmodal task may be failure to accurately encode the temporally (rhythmically) presented components into a visual representation. Looking further at psycholinguistic research, we find additional support in the need for metacognitive organization in this sound/language (time), visual/graphic (spatial) relationship. Rozin, Bressman, and Taft (1974) demonstrated in a study of sound to visual mapping of standard English that slow readers had not acquired the fundamental relationship between writing and speech. In contrast, average readers demonstrated this fundamental relationship. This suggests the manipulation of continuous speech sound streams and the organization of their symbolic representations appear to require conscious cognitive activity. The purpose of the present study was to compare the success and strategies of readers of different proficiencies across developmental levels, thus creating an opportunity to observe reading processes as related to symbolic sound mapping.

Method

Subjects

Ten children each from grades 1, 3, and 5 in a suburban elementary school participated in the study (N=30). Of the 10 subjects in each grade, five were average readers and five below-average readers, as determined by the Stanford Reading test. Subjects were either at grade level or more than one year below grade level in reading achievement, respectively. Children with coordination or motor difficulties were excluded since this area interfered with the interpretion of success in the rhythm clapping production tasks.

Since one objective of this study was to determine if the methodology was indeed feasible to show the kinds of processes under investigation, a smaller than optimal number of subjects was used. Two related questions were: does the methodology allow for observing manifestations of processing, and does it have the potential for generating important additions to our understanding of cognitive processing? Much like Goodman's (1965, 1969) miscue analysis of deviations from the text (or task in this case), the response along with the subject's protocol provides a "window" to see into the subject's processing. Through careful examination of patterns across the reader's miscues, it is possible to make inferences about the reader's strategies. Employing one investigator, because of obvious effects on data collection, also made it necessary to use a smaller number of subjects. Enlarging the number of subjects would add a crucial time-developmental factor. The reading abilities would be different at the end of the study from the beginning, thus affecting ability to compare task variables.

Procedure

Subjects individually participated in two 30 minute sessions to carry out three game-like tasks; each task was preceded by a practice session. All responses were recorded for later analysis. Children were observed, interviewed, and they reported on the organizational strategies and processes they employed in each task.

Session one involved games for rhythm reproduction (task 1) and manipulation (task 2) of sound events. This was carried out by echo-clapping and echo-buzzing (with a buzzer) with ten prerecorded rhythm samples heard over headphones. Each sample was presented twice ("ready--listen") and repeated on request. Manipulation of the rhythm (task 2) involved three games for sound manipulation. First, the examiner made the modification and the subject reported on the change. Second, the subject was asked to make a specific modification (manipulations in accents/loudness; rests/omissions; combining and reversing rhythm patterns).

Session two involved tasks for visual representation of the sound stream (task 3). Subjects visually encoded ten rhythm buzzer samples heard over headphones, first using manipulative disks for representing the sound and then with paper and pencil. Before coding, the subjects played the sample on the buzzer allowing for comparison of their sound production with their visual representation. Each sample was presented two times on the tape before a response was required.

Results and Discussion

Task 1: Reproduction of the Sound Event

Reproduction of the sound event gives insight into the subject's ability to perceive and reproduce the rhythm sample. The investigator needs to first find out if the subject can accurately produce the rhythm sample before asking them to manipulate and encode the sounds.

Accuracy in reproduction of the sound event increased developmentally across grade levels. Average and below-average readers achieved near equivalent success in the number correct for reproduction of rhythmic sound events. However, an important difference was observed in the extent of error within a given sample between the two groups. The degree of error within samples was greater for below-average readers than average readers.

Task 2: Manipulation of Sound Event

Manipulation of the sound event requires not only the direct reproduction of the sample but the subject must also encode the entire sample and make changes in segments of the sound. This task is similar to what is required in metalinguistic awareness that the reader must apply in the reading situation, namely, producing individual phonemes and blending the sounds together.

Results showed a developmental trend across grades with no success in manipulation tasks for below-average first grade readers. Below-average third and fifth grade readers demonstrated increasing levels of accuracy, but still performed below the average readers. Below-average readers had greater difficulty in performing a requested manipulation task versus reporting on the change in a sample. Those who appeared in a "transitional" mode could report but also could not manipulate the rhythm successfully. Reasons for this result may be that more time was needed to assimilate the process of the task required, or that there were too many processes for the subject to coordinate simultaneously. Again, we may have seen that the below-average readers were having difficulty with the metacognitive act of segmenting the sound into its parts, as occurs in the metalinguistic task in reading.

Task 3: Visual Representation of Sound Events--Coding

In this final task we investigated whether the subject could make a visual representation of the sound sample. By comparing their sound reproductions of the sample with their visual representations of the sample, we may be able to understand the cognitive organization of the sound, apart from memory and perception. At the same time we were able to study the approach subjects used in carrying out the representation task.

All below-average readers demonstrated greater difficulty in visually coding rhythmic sound events. Readers immediately "understood" the coding concept of sound represented visually. They proceeded with the task systematically, segmenting the sample into parts, writing, checking and combining units, visually representing the number of units and the pattern of the sound. Below-average readers did not approach the task with an apparent analytic system, but instead tried to physically "play" the sound onto the paper, without demonstrating signs of segmenting or combining units. They typically represented only the number of buzzes without any representation of sound pattern. In some cases, there was no apparent relationship, while some actually drew concrete pictures of the buzzer. Thus subjects moved into increasing levels of abstraction. Subjects who appeared to be in a transitional mode tended to combine trial and error with number counting strategies.

In general, an overall developmental trend across grade levels was observed, yet a distinct difference in success between average and below-average readers was maintained. Subjects who could not manipulate the sound sequence tended to code only the number of buzzes, employing a trial and error type of approach. As the sound manipulation skill increased, coding number and sound pattern increased in both degree and accuracy. Subjects who achieved 100% accuracy with manipulation tasks encoded both the number and sound pattern.

Summary and Conclusions

1. Average readers generally approached all tasks with organizational strategies; subjects who appeared in a transitional mode used a trial and error or counting approach; below-average readers appeared to approach all tasks randomly.

2. All subjects appeared to be equally successful in reproduction of sound samples but the errors made by below-average readers were more severe.

3. Below-average readers demonstrated more problems and less accuracy in manipulating sound events than average readers, with an observable developmental trend across grades.

4. Below-average readers coded only the number of sounds without including the pattern or visual organization of the sound, while average readers coded both number and pattern with higher accuracy.

5. Developmental patterns for coding proceeded from no apparent direct relationship with concrete pictures, to numbers with increasing levels of accuracy, to numbers and some patterns included, to numbers and patterns, with increasing accuracy, and finally to numbers and more accurately complex pattern encodings.

These results suggest that accurate auditory-visual integration of rhythmic samples appears to be influenced by the subject's ability to cognitively organize and segment the sound stream, particularly as demonstrated by coding rhythm samples. A question remains concerning whether success in these tasks is a symptom or result of reading ability and experience. There is also the possible involvement of developmental and individual learning style factors which need to be taken into account and studied. This methodology holds promise for observing individual differences in cognitive organization and approach to symbolization, specifically, reading differences and processes.

This methodology holds potential for studying and evaluating children's schemata for sound organization. There may also be merit in using music-rhythm game activities to help teach learning

strategies that would develop sensory and sound manipulation. Results also suggest that music educators need to be aware of the difficulty and the developmental and ability differences in integrative tasks when planning and carrying out music curriculum.

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Spatial Relations in Stereotypic Representations[1]

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A number of factors have been suggested as influencing young children's drawings. Spatial knowledge has been proposed by Johnson, Perlmutter, and Trabasso (1979) and by Freeman (1980) as a determinant of drawings. They all assume that mental representation of spatial relationships, that is, knowledge of focal points such as head and feet, directs drawing and verbal denotation of the human figure and its parts.

The purpose of this study was to describe the emergence of spatial relationships in young children's stereotypic depictions. Specifically, developmental data were collected to test the presumption that end-anchoring effects can account for children's representations of the human figure (Johnson, et al., 1979; Freeman, 1980), and presumably other objects that children represent. Are the internal representations that contribute to depictions organized spatially, so that head and feet emerge early in depiction, while other body parts emerge later? Can this spatial model apply to depictions other than human figures? And, finally, how does medium of production inform us about spatial relationship depiction; does it make a difference what children use to symbolically depict stereotypic objects?

Johnson, Perlmutter, and Trabasso (1979) claimed that children's representation of body parts is guided by spatial knowledge, building on a similar argument advanced by Freeman (1980). They provide evidence to argue that knowledge of body parts is represented mentally in terms of end-anchors, with head and feet serving as focal points for mental representations. As children mature, they add to these end-anchors, hierarchically adding more parts to their increasingly elaborated representations. Johnson, et al., review the human figure drawing literature and claim that it supports their end-anchor model; young children's head-and-legs "tadpole" drawings precede older children's more differentiated drawings that include trunks, arms, and other mid-body parts. Norms from the Draw-a-Man test (Goodenough, 1926; Harris, 1963) are cited as further evidence that children's representations, both mental and symbolic, are organized spatially around top and bottom focal points. Johnson and her colleagues see depiction as being controlled by these spatial constraints; spatial relationships prevent young children from depicting as many parts between the head and feet (or legs).

This account fails to consider a number of factors. First, children do not symbolically depict all they know. Second, what they depict may be influenced dramatically by the medium they use to represent (Golumb, 1973). (Johnson, et al., analyzed drawings and

action depictions of body parts, but they did not consider how other plastic media might influence children's production of parts.) And finally, they did not consider how spatial relationships other than linear ones, that is, the human body is basically polar, might be represented. The present study attempts to further our understanding of the influence of spatial foci on depiction by documenting the development of spatially related parts (of the human figure and of a house) by children who range in developmental level from scribblers to conventional drawers. To assess the influence of depictive medium on their representations, a number of media (markers, paint, clay, blocks) were used by each child. In order to assess the child's mental representation, a recognition task was provided, wherein the child verbally identified parts on a model.

Methods

Subjects were 60 children, with approximately 20 children in each of 3 age groups (age group mean of 63 months, 86 months, and 106 months). The youngest children were still at the scribble stage of drawing, while the oldest were well able to draw conventionally. The number of males and females in each group was nearly equal. Children were randomly selected from full-day child care programs, either in public schools or in church affiliated schools. All children worked individually with a female graduate student research assistant who participated in the programs for several days to become familiar to the children. On 3 or 4 days, usually within one week, each child was taken to a room where four child-size tables and chairs were arranged with the following: paper with 8 colored markers, an easel with 6 brushes and colored poster paints, 6 ounces of gray plasticine, and a set of table top building blocks. The order in which each medium was offered was counterbalanced across children. After one exposure to each material, when the child could choose to make anything, the researcher asked the child to make the best person or house that could be made. The order in which the referent was requested was randomized across a child's daily sessions. When the child completed the requested depiction with each of the 4 materials, a detailed verbal description of each was elicited. The child was then asked to describe a model shown by the researcher. If the child did not spontaneously name a given part of the model, the child was asked about that part. The child was then allowed to make any additions or changes to the depictions. Photographs were taken of clay and block depictions, and paintings and drawings were saved. These were coded at a later date.

Each child's depiction was independently coded by two graduate students who identified the presence or absence of nine body parts, (hair, head, face features, torso, clothes, arms, hands, legs, feet), and of six house parts, (chimney, roof, walls, window, door, floor). The correlation between their coding was .73. The child's verbal description of each part of their depictions and of the models was recorded during the session.

Results

Two patterns of depiction are relevant to the current analysis. If, as Johnson, et al., and Freeman suggest, there are end-anchoring effects, then there should be an increase with development of depiction of centrally located parts; as children grow older, they should include in their drawings a greater number of torso and arms as parts of the body. Likewise, if there are end-anchors, then head and feet (or legs) should be consistently represented by children of all ages. (Johnson, et al., used "foot" as the bottom-most part for their language study, but cited data on leg and not foot for drawing data. The current study looks at both leg and foot in children's depictions.)

The number of children in each age group who represented any body or house part was analyzed using a series of chi square tests. Those data are presented in Table 1 (for the human figure) and Table 2 (for houses). Significant chi squares are marked, as well as possible trends ($.10 < p > .05$). These data should be considered in light of the fact that virtually all children at all age levels could recognize word labels for all body and house parts. Mental representations as measured by verbal descriptions, did not correspond with produced symbolic depictions (Reifel, 1984).

There were significant age-associated increases in the depiction of specific body and house parts, but the increases do not follow a consistent pattern indicating that spatial factors were at play for mental or symbolic representations. The developmental increase in mid-body parts does appear in drawing (torso, clothes, arms), clay (torso, arms), and painting (torso, clothes, arms). Conversely with blocks a mid-body part (torso) is the predominant part from the earliest years; it is the head that appears more often as children develop. There are also other end-anchor parts that become more common with increasing age, contrary to Johnson, et al.'s position, with clay (head, legs, feet) and painting, (hair, head, feet). Whatever the child's internal representation of the body is, its spatial manifestation varies a great deal depending on medium of depiction. End-anchoring can be seen in drawing, but it does not seem to spatially describe representation with clay, painting, or blocks.

The house data are possibly less helpful, since the parts were arranged for analysis in a linear form, while some house parts are actually embedded within others. In any case, it seems clear that dominant central (wall) and end (roof) parts are present and common from the earliest years in all media, except the wall in paintings. The parts that emerge developmentally are embedded parts (doors). End-anchoring seems less relevant as a guiding principle here; hierarchical embedding appears to be more of a challenge with depictions of objects like a house.

Discussion

The findings presented here appear to be inconsistent with an end-anchoring model, (Johnson, et al., 1979; Freeman, 1980), and point to the importance of media as a factor influencing stereotypic depiction (Golumb, 1973). For house depictions there were fewer findings. There were significant increases in mid-region parts in drawings (doors) and paintings (doors, walls), but the absolute frequencies tended to be lower across house parts as compared to human body parts. Overall, the findings suggest an inconsistent relationship between mental and symbolic representations, no clear spatial factors influencing symbolic representations, and a clear influence of medium of production on depiction. End-anchoring effects do not account for depictions of the human figure.

Methodologically, further work must consider the nature of the orientation of a given referent as a factor when considering spatial influences on depiction. The present study's attempt to vary spatial orientation by looking at both human figures and at houses was not successful, in the sense that the house parts were analyzed in what was basically a linear, vertical orientation. A better comparison would involve a referent with an horizontal orientation, such as a dog, horse, or pig. This would provide a more decisive empirical contrast to the up-right human figure. Even with this additional consideration, it is likely that media would still be a major influence on depiction.

Conceptually, the question of the relationship between mental images and produced images appears to be problematic. What is depicted does, to some extent, vary with medium of production. It seems fair to ponder what form (or forms) of mental structure might guide productions. Is there a stereotypic mental representation that serves as some kind of model? Are there multiple representations that compete with one another in ways that vary as the child develops? Do media "suggest" forms that are elaborated by knowledge of parts and relationships? Does performance shape itself, with each creative stroke leading to new depictive possibilities? There are many topics to explore in the realms where symbolic and mental representation interact.

Educationally, these findings point to the need for assessing children's depictive performance based on a range of media. Judgments about children's work and what that work reflects about mental states must be based on an understanding of what children can do with different materials at different ages. Scientifically, the findings suggest that theories of mental and symbolic representation must consider methodological factors, such as medium of depiction, when assessing representational competence. Spatial factors, such as end-anchors, are inadequate to explain production biases such as tadpole drawings.

Table 1
Percent of Age Group Depicting Each Body Part
(X^2 p's, df = 2)

	Drawing				Clay			
	Age* Group 1	Age Group 2	Age Group 3	p	Age Group 1	Age Group 2	Age Group 3	p
Hair	71.4	90.0	94.7	.09	38.1	45.0	36.8	
Head	95.2	100.0	100.0		71.4	95.0	100.0	.01
Face	90.5	95.0	100.0		47.6	65.0	73.7	
Torso	76.2	100.0	100.0	.006	52.4	95.0	94.7	.0005
Clothes	28.6	75.0	94.7	.0001	0.0	10.0	15.8	
Arms	81.0	100.0	94.7	.07	52.4	85.0	94.7	.004
Hands	66.7	75.0	89.5		4.8	10.0	26.3	
Legs	90.5	95.0	89.5		47.6	90.0	100.0	.0001
Feet	57.1	80.0	78.9		9.5	35.0	42.1	.05

*Age Group 1 n = 21

Age Group 2 n = 20

Age Group 3 n = 19

Painting				Blocks			
Age Group 1	Age Group 2	Age Group 3	p	Age Group 1	Age Group 2	Age Group 3	p
38.1	85.0	78.9	.002	4.8	5.0	15.8	
85.7	100.0	100.0	.05	85.7	100.0	100.0	.05
71.4	75.0	78.9		9.5	0.0	0.0	
47.6	95.0	100.0	.0001	90.5	90.0	100.0	
19.0	55.0	47.4	.05	0.0	0.0	5.3	
52.4	95.0	78.9	.006	52.4	75.0	84.2	.08
14.3	40.0	42.1		9.5	5.0	26.3	
66.7	85.0	73.7		66.7	90.0	89.5	.09
9.5	55.0	42.1	.007	9.5	40.0	21.1	.07

Table 2
Percent of Age Group Depicting Each House Part
(X^2 p's, df = 2)

	Drawing				Clay			
	Age* Group 1	Age Group 2	Age Group 3	p	Age Group 1	Age Group 2	Age Group 3	p
Chimney	52.4	65.0	68.4		23.8	45.0	57.9	.09
Roof	95.2	100.0	100.0		66.7	75.0	84.2	
Walls	95.2	95.0	100.0		66.7	85.0	89.5	
Window	71.4	95.0	89.5	.09	23.8	25.0	36.8	
Door	76.2	95.0	100.0	.03	19.0	40.0	52.6	.08
Floor	38.1	40.0	71.1		19.0	20.0	26.3	

*Age Group 1 n = 21

Age Group 2 n = 20

Age Group 3 n = 19

Painting				Blocks			
Age Group 1	Age Group 2	Age Group 3	p	Age Group 1	Age Group 2	Age Group 3	p
38.1	50.0	63.2		52.4	55.0	57.9	
90.5	100.0	100.0		95.2	90.0	94.7	
81.0	100.0	100.0	.02	95.2	100.0	100.0	
42.9	65.0	68.4		14.3	35.0	10.5	
52.4	90.0	94.7	.002	47.6	70.0	68.4	
33.3	45.0	26.3		42.9	25.0	21.1	

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Footnote

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The Effect of Verbalization in Understanding Visual Art

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Although visual art are pictorial stimuli, they are often examined in the context of verbal information. Among the types of verbal contextual information associated with art are descriptions and interpretations. Descriptions, as they are referred to in this study, are words, phrases, or statements that describe the representational content of art; interpretations are those that characterize expressive qualities. Examples of both types of verbal contexts often typify titles of art, i.e., The Stove is a descriptive label for one of Claes Oldenburg's sculptures; Peaceable Kingdom is an interpretive title for a number of paintings by Edward Hicks.

An assumption of the present study is that descriptive and interpretive labels such as these are usually not interchangeable. That is, it is inappropriate to describe Hick's Peaceable Kingdom as a stove or to interpret Oldenburg's The Stove as a peaceable kingdom. For viewers to mistake either title as a match for the other work of art is an indication they have inaccurately processed the artwork's meanings, at least in part. Similarly, matching descriptive and interpretive words to an artwork's representational features and expressive qualities provide indices of viewers' understanding of that work. Such indices, in the form of word-match and title-match tests, were used in the present study to determine whether verbal contexts supersede the effect of viewer-generated verbalizations, and to determine whether either form of verbal processing surpasses the effect nonverbal responses have on deriving meanings from art.

Comparison of verbal and nonverbal art viewing strategies in previous research indicated meanings were comprehended more readily when adult viewers generated verbal responses to art (Koroscik & Blinn, 1983; Koroscik & Osman, 1985). Artworks of varied levels of abstraction were presented to subjects without accompanying verbal information. Nonverbal task demands instructed them (a) to trace lines in a specified area of an artwork or (b) to match the linear qualities of one artwork with those observed in three other works. Verbal tasks asked viewers (a) to label representational features in a specified section of an artwork or (b) to generate an appropriate title for a work. Results of the study indicated the latter verbal task exceeded all others in promoting the retention of descriptive meanings (i.e., those meanings pertaining to the representational content of art).

A subsequent investigation studied verbalization effects further by examining how verbal contextual information (in the form of descriptive and interpretive titles) affect the art viewing

process (Koroscik, Desmond, & Brandon, in press). Adult viewers were asked (a) to consider each work of art in relation to its original artist-generated title in a correct title context condition, (b) to examine each work in relation to a misleading experimenter-generated title in an erroneous title context condition, (c) to view each artwork and produce an appropriate title of their own in a generate-title context condition, or (d) to study each work of art for which no title was given in a no title context condition.

Findings of this research indicated viewers were more accurate in processing meanings when artworks were presented with correct title contexts. The effectiveness of such verbal contextual information was, however, found to vary as a function of the type of verbal contexts given (descriptive vs. interpretive titles), the kind of meanings processed (descriptive vs. interpretive meanings), and the abstraction level that characterized each work of art (low vs. medium vs. high abstraction). Correct titles were found to be most useful when viewers attempted to determine interpretive meanings about the expressive qualities of art. Descriptive meanings were processed more readily than interpretive meanings by viewers in all four context conditions. However, only correct descriptive titles aided in the understanding of highly abstract works of art.

The present study was designed to extend and, to a certain extent, replicate these earlier findings. A limitation of the previous research was that it did not examine how the effects of verbal and nonverbal processing task demands vary when artworks are shown with and without verbal contextual information. This is a problem of some practical significance in the field of art education. Art teachers frequently ask students to respond to art on nonverbal terms (e.g., study linear qualities or note other structural attributes) and assume that accompanying verbal information such as titles, artists' names, and historical information will automatically be applied in comprehending meaning. On the basis of previous findings, it seems unlikely that verbal contexts will have much impact on students' understanding of descriptive and interpretive meanings when nonverbal viewing responses are elicited by task demands.

Viewer-generated verbalizations are likely to surpass the effect of verbal contexts when they accompany artworks exhibiting low levels of abstraction. In order to form their own verbalizations about art, viewers must gather meaningful cues from what they observe in the structural (visual) form of an artwork. They must then translate those cues into verbal terms according to task instructions. This constructive process may not be matched when viewers merely take note of how others verbalize about art. Yet as art becomes increasingly abstract, verbal contexts may provide informational cues about descriptive and interpretive meanings that cannot be easily comprehended from simply looking at the visual features of art stimuli.

Method

Design and Subjects

Three levels of Title Context (correct title vs. erroneous title vs. no title) formed between-subjects groups in the experiment. Processing Task (nonverbal-focal, nonverbal-global, verbal-focal, verbal-global) and Abstraction (low, medium, high) were manipulated as within-subjects variables. The design was thus a 3 (Title Context) x 4 (Processing Task) x 3 (Abstraction) mixed analysis of variance.

Thirty-six elementary education majors attending The Ohio State University were randomly assigned in equal numbers to the Title Context conditions. The subjects had no prior education in studio art or art history at the college level excluding the art education methods class in which they were currently enrolled.

Materials

Visual art stimuli. Forty-eight artworks (drawings and paintings) were reproduced as 8 x 10 inch black and white photographs for use in the experiment. This selection was based on abstraction level differences, i.e., an equal number displayed low, medium, and high levels of abstraction as rated by three independent judges with advanced degrees in the visual arts. Abstraction level differences were associated with the degree to which the representational characteristics of art deviated from their real-world referents (i.e., low abstraction = high realism).

Title contexts. Original artist-generated titles were presented to subjects in the correct title group. Misleading titles were prepared by the experimenters for use in the erroneous title condition. These titles held a middle value of inaccuracy as rated by three independent judges on a scale from one to five (1 = correct match; 5 = arbitrary match). Unlabeled reproductions were presented to the no title group.

Processing tasks. The tasks were similar to those used by Koroscik and Blinn (1983). They were designed to elicit verbal or nonverbal responses to the artworks presented to subjects. The nonverbal-focal task instructed subjects to place acetate over the quadrant outlined in the work they viewed and to carefully trace all lines that appeared within the outlined area with a red fine-point marking pen. The nonverbal-global task directed subjects to approximate the number of areas within an entire artwork that matched in value with one of 10 different value strips. The verbal-focal task asked viewers to trace and label all identifiable things represented within a specified quadrant of an artwork. Marking pens and clear acetate were provided as in the nonverbal-focal task. The verbal-global task instructed participants to examine a work in its entirety

on verbal terms by generating a title that best characterized that work. The latter task was the only one in which titles did not accompany artworks in the correct and erroneous title context conditions.

Dependent measures. The word-match test consisted of 12 words for each work of art. The list included six nouns that referred to representational content (descriptions) and six adjectives that characterized expressive qualities (interpretations). Half of the word list actually corresponded to the artwork shown, while the remainder did not as determined by a panel of three trained judges. Matches and mismatches were generated from a synonym-antonym dictionary and were validated by a review of literature on each work of art. For example, the following words were used in the test for Edward Hicks' Peaceable Kingdom:

1. Descriptive matches: leopard, lamb, colonists
2. Descriptive mismatches: Horse, boat, waterfall
3. Interpretive matches: harmonious, compatible, passive
4. Interpretive mismatches: discordant, vicious, entrapped

Subjects' responses to the word-match test were made by indicating (yes-no) whether each word corresponded to the artwork just viewed. These responses were scored by totaling the number of descriptive and interpretive errors.

The title-match test was identical to one used in a previous study (Koroscik, Desmond, & Brandon, in press). As with the word-match test, it contained both descriptive and interpretive items. Subjects were asked to determine whether six titles per artwork matched, somewhat matched, or did not match the work. Of these six titles, two titles actually matched the work as artist-generated or similarly correct titles; two experimenter-generated titles matched the artwork somewhat in that they referred to semantic characteristics but in a misleading way; and two titles did not match the work whatsoever. For example, the title-match test for Edward Hicks' Peaceable Kingdom included the following items:

1. Landscape with Animals (descriptive, matches)
2. Peaceable Kingdom (interpretive, matches)
3. Carnival Animals (descriptive, matches somewhat)
4. Wild Kingdom (interpretive, matches somewhat)
5. Store Front (descriptive, does not match)
6. Battle of Light (interpretive, does not match)

Since subjects in the correct and erroneous title context conditions were given one of the titles from the title-match test during presentation, they were asked to record the name of that title in their test booklets just prior to taking the test. It was thereby possible to determine the accuracy with which presentation titles were remembered and whether subjects chose to disregard those titles when making responses on the title-match test. These responses were scored by summing descriptive and interpretive errors as on the word-match test.

Procedures

Subjects were tested in groups of not more than 12 persons within a well lit testing environment that offered minimal distraction from extraneous stimuli. The participants were randomly assigned to title context conditions and were given test booklets containing the 48 art reproductions, task instructions, and both forms of the dependent measure (artworks and tasks were independently randomized for each booklet).

Subjects examined every artwork for exactly one minute while performing one of the four processing tasks. Each presentation was immediately followed by a one minute interpolated task demanding concentrated attention on such activities as weaving paper strips into slotted paper, constructing three-dimensional paper boxed, and drawing detailed floor plans of former residences. The purpose of these activities was to preclude short term memories from biasing subsequent recall. Respondents were next given as much time as they desired to complete the word-match and title-match tests in that precise order. A dictionary was available and used whenever subjects were unsure of the meaning of words that appeared on the tests. When both tests were complete, the next artwork was examined and responded to according to processing task demands. The procedures were then repeated until subjects responded to a total of eight artworks during the first session. Five subsequent sessions (each lasting between 45 and 60 minutes) were conducted until all 48 artworks were presented for testing.

Results and Discussion

Results of the word-match test indicated significant differences for: Context, $F(2, 33) = 5.33$, $p < .01$; Processing Task, $F(3, 99) = 9.61$, $p < .0001$; Abstraction, $F(2, 66) = 128.86$, $p < .0001$; Context x Error Type, $F(2, 33) = 6.67$, $p < .004$; Abstraction x Error Type, $F(2, 66) = 63.63$, $p < .0001$; and Context x Abstraction x Error Type, $F(4, 66) = 6.06$, $p < .0003$.

Title-match test findings were consistent with word-match test results. Significant differences were found as a function of: Context, $F(2, 33) = 4.29$, $p < .02$; Abstraction, $F(2, 99) = 9.61$, $p < .0001$; Context x Error Type, $F(2, 33) = 5.98$, $p < .006$; Context

x Abstraction, $F(4, 66) = 2.74$, $p < .04$; and Abstraction x Error Type, $F(2, 66) = 13.04$, $p < .0001$.

As expected, post hoc analyses of both tests indicated fewer errors were made by the correct title group than by the erroneous and no title context groups (ps < .01). The superiority of correct titles on the word-match test was, however, limited to descriptive errors for highly abstract works of art ($p < .01$). Apparently, descriptive words were readily matched to artworks of lesses abstraction regardless of contextual cues.

Overall, interpretive words and titles were more difficult to match than descriptions (ps < .01). Such results replicate previous findings (Koroscik & Blinn, 1983; Koroscik, Desmond, & Brandon, in press) and are in line with the predictions of the levels-of-processing hypothesis (Craik & Lockhart, 1972; Nelson, Reed, & McEvoy, 1977). To the contrary were findings that indicated subjects in the erroneous and no title context conditions made fewer interpretive word-match errors than descriptive errors for highly abstract art (ps < .01). However, these results may be a function of correct titles that circumvented more interpretive processing by resolving the question of what an artwork was "about" to viewer satisfaction.

This explanation is consistent with the finding that subject-generated titles produced in response to the verbal-global task surpassed the effect of all other task demands. The titling task was designed to elicit interpretive responses and was the only task for which artworks were shown without correct and erroneous titles. Although subjects were highly accurate in recalling this verbal contextual information, it did not exceed the effect of task demands in determining the nature of information subjects processed and retained about the artworks they viewed.

Educationally speaking, these findings have important implications for the design of visual art curricula. They again point up the need to involve students in structured learning experiences that demand active responses when viewing art. Introduction of verbal information pertaining to art can enhance its interpretation, but only when students comprehend the relationship between that information and their own observations.

References

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3.41 Arts Education and Curricular Contexts (2:15-3:45; March 31)

Chair: ViLora Lyn Zalusky, South Carolina Department of Education

Participants: A Descriptive and Analytical Study of Art Criticism Methodologies with Implications for Context-Specific Implementation. Karen Hamblen, California State University at Long Beach

**Your Name in Lights, or What is Talent? The Relationship of Dramatic Behavior to Creativity, School Attitude, and Intelligence. Helane Rosenberg, Patricia Finciotti, Rose Castellano, Rutgers University

**The Routinization of Elementary Art Curriculum: A Multi-Site Case Study. Wanda T. May, The Ohio State University

Teaching and Learning in Art: The Acquisition of Art Knowledge in an Eighth Grade Class. Nancy R. Johnson, Ball State University

Critics: Robert Donmoyer, The Ohio State University
Maxine Greene, Teachers College, Columbia University

14.39 Aesthetic Education and Community: Resources, Reciprocity, and Moral Ramifications (10:35-12:05; April 1) Co-sponsored by Division B

Chair: Ted T. Aoki, University of Alberta

Participants: Aesthetic Theory, School Knowledge, and Moral Understanding. **Landon E. Beyer, University of Rochester

Art and Science in Technical/Rational Society. Philip Steedman, University of Nevada

**Finding the Public Arts Curriculum of American Communities. Elizabeth Vallance, Kansas State University

**Guilt Frames: Museums Look at Looking. James S. LaVilla-Havelin, Memorial Art Gallery of the University of Rochester

Discussant: **Aesthetic Education as Exchange: Gifts or Commodities? Madeleine Grumet, Hobart and William Smith Colleges

22.07 Business Meeting (6:15-7:45; April 1)

22.28 Children Drawing from Observation: Theoretical Perspectives and Implications for Art (10:35-12:05; April 2)

Chair: Calvin Nodine, Temple University

Participants: A Developmental Study of Intellectual Realism in Pictorial Representation. Francis S. Beyer, Calvin Nodine, Temple
**University

Four- and Eight-Year-Old Children's Development of Drawing Strategies to Represent the Perspective of a Three-Dimensional Model. Cynthia Colbert, University of South Carolina; Martha Taunton, University of Iowa

Curriculum Research in Observation Drawing. Nancy R. Smith, University of Oregon

Discussant: Jean C. Rush, University of Arizona

36.11 Art, Curriculum, and Instruction (6:15-7:45; April 2) Co-Sponsored by Division B

Chair: Stuart Reifel, University of Texas at Austin

Participants: A Social and Moral Critique of the Arts Curriculum. Susan W. Stinson, University of North Carolina at Greensboro

**Evaluation of the Effects of Social Contexts On the Arts: An Educational Criticism of Art Teachers' Classroom Instruction. Bonnie Harris, Hersholt C. Waxman, University of Houston

Relationships Between Writing and Drawing in First Grade Children. ViLora Lyn Zalusky, South Carolina Department of Education

**Implementing Arts in Education: Redefining the Basics of an Elementary School Curriculum. Diane Kyle, Ric Hovda, University of Louisville

52.09 Cognitive Structures in Learning in the Arts (8:45-10:15; April 3)

Chair: Patricia Pinciotti, Rutgers University

Participants: Constructing Musical Knowledge. Gary Greenberg, Rutgers University

The Effect of Sustained and Nonsustained Tones on Adult's Representations of Simple Rhythms. Carolyn Hildebrandt, University of California at Berkeley

Observing Children's Metacognitive Structures through Music--Rhythm Processing. Linda L. Kelley, Philadelphia College of the Performing Arts

Spatial Relations in Stereotypic Representations. Stuart Reifel, Elizabeth Strand, University of Texas at Austin

The Effect of Verbalization in Understanding Visual Art. Judith S. Koroscik, The Ohio State University

Discussant: William Ives, Wheelock College

**Papers unavailable for publication.